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**NOTES FROM THE FRONT.**

**COLLATED BY THE GENERAL STAFF.**



**Part II.**

**REPRINTED BY AUTHORITY, FOR THE DEFENCE  
DEPARTMENT, AUSTRALIA.**

**1914.**

**C.18771.**

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# NOTES FROM THE FRONT.

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## Part II.

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1914.

C.16771.

## PREFACE.

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The following points are particularly emphasized in all reports received from the front:—

1. The importance of constant practice in digging at night. It is considered that actual practice in supplying food and ammunition to men in the trenches at night would be very useful training.

2. The necessity for scrupulous care of rifles in order to ensure their smooth working during rapid fire.

3. The need of impressing upon young officers the fact that one of their first and most important duties is to look after the comfort and well-being of their men at all times, and that it must be a point of honour to do so before thinking of their own needs.

4. The importance of inculcating the doctrine that the temporary exposure of a flank owing to a local success on the part of the enemy should be looked upon as an occasion for counter-attack and not for withdrawal. Proper measures to watch the flanks should be taken and men should be held ready to counter-attack if a flank is threatened, but the idea that a withdrawal is always justified merely because a flank is temporarily turned should never be permitted to take root.

It should be a point of honour with all officers to carry through any task confided to them *without asking for reinforcements*.

5. The necessity for careful training in wood and village fighting, especially the latter; attention is directed to sections 141-146, Infantry Training, 1914.

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## NOTES FROM THE FRONT: PART II.

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### I.—CAVALRY.

1. *German Cavalry*.—The German cavalry is always supported by Jägers and cyclists, and by infantry in motor cars, each car holding about 30 men. It seldom adopts offensive tactics mounted, nor does it often hold positions dismounted with any determination. Its rôle seems more generally to be to draw its opponents on under the fire of its cyclist and infantry supports. When attacked, the cavalry usually retires, clearing to a flank and unmasking the position held by the latter, which is very often entrenched. On the few occasions on which the enemy has attempted a mounted attack he has been met by rifle fire and a mounted counter-attack and beaten off with heavy loss.

2. *Training*.—Our cavalry has shown a marked superiority over the German cavalry, both as regards training and moral. The great importance of good squadron and regimental drill has been apparent. Some knowledge of brigade drill is necessary.

Too much stress cannot be laid on the service of security, and the covering of advances or of troops in readiness by a skilful use of ground. A high education in courage, independence, and self-reliance is most necessary.

3. *Cavalry Patrols*.—It has not been found advisable to lay down particular formations for patrols, but the principles of the training manual must be followed. Patrols should invariably carry their swords—not their rifles—in their hands ready for immediate use. On meeting a hostile patrol, even of superior numbers, they should charge at once at a gallop. These tactics have proved universally successful.

Reports from the front emphasize the importance of the instructions in Cavalry Training, section 185 (4), as regards the method of approaching woods, villages, &c. The Germans often remove a tile or two and shoot through the roofs of houses.

4. *Reports.*—The necessity of drawing a clear distinction in reports between information which is certain and that which is only presumed or inferred has been very apparent, as has also the value of negative information. All messages should be written on Army Form C.2121, and it is important that all ranks should accustom themselves to the use of this Form during peace training. Verbal messages seldom reach their destination correctly and should be avoided.

5. *Billets.*—Billets are nearly always obtainable at night, mostly in farm buildings and outhouses. It is essential to send on good billeting parties in advance as soon as the billeting area has been decided upon. A suitable strength is one officer and one good non-commissioned officer per squadron and an interpreter. The same men should be told off permanently as far as possible. Horses have to be placed close together; a good pace a horse has been found to suffice, though kicks are apt to result at first till horses begin to get stale. If the horses can be fitted in there is usually no difficulty about accommodating the men in houses, lofts, &c. It should be the invariable rule to saddle up in the dark, ready to move at dawn, and as soon as it is light to send out an officer's patrol from each squadron to reconnoitre the immediate vicinity.

6. *Led Horses.*—Led horses must be carefully hidden. If hostile aeroplanes come over and there is any chance of the horses having been observed, they must be moved immediately the aeroplane is out of sight, otherwise they will be shelled before very long.

7. *Machine Guns.*—It has been found best always to carry machine guns on pack when near the enemy.

8. *Signalling.*—Flag signalling has often been found useful by our cavalry.

9. *Equitation.*—A staff officer at the front draws particular attention to the necessity for constant practice during training in rapidly mounting and dismounting.

10. *Equipment.*—Some notes by a cavalry officer on the equipment of officers and men are given in Appendix I.

## II.—ARTILLERY.

1. *Selection of Positions.*—Under modern conditions with aeroplanes the selection of positions is of the utmost importance. Even when behind cover and hidden

from view from the enemy's position, a battery which is not concealed from aeroplanes is liable to be destroyed by the enemy's shell fire. Concealments may be obtained by the selection of positions in belts of trees, on the edges of woods, or in fences studded with trees. Small trees may also be cut down and planted not only round the guns but in the intervals between them, so as to produce the effect of a natural belt of trees. Alternative positions should be prepared, and dummy positions should be made use of to mislead the enemy. Whenever it appears that the position of a battery has been located by the enemy, a change of position should be made under cover of darkness. In all circumstances it is important that positions should be selected which will not be disclosed by the flashes of the guns. Batteries are almost invariably in action separately, and there is a tendency to employ sections by themselves as they can produce great fire effect with a minimum chance of discovery. A small definite target such as a portion of a trench, a house said to contain snipers, or a machine gun, which can be seen, is often most effectively engaged by a single gun. Single guns have in some cases been dug in to strengthen the infantry line of trenches at night. They should be removed at dawn, and if required again the following night should only be put back again in the same emplacements if their positions have not been discovered by the enemy.

2. *Observation of Fire.*—Very extensive use has been made of forward observers, i.e., subaltern officers pushed right forward with the firing line or in the advanced infantry trenches and connected by telephone with their batteries. These officers are able to send back accurate observations with regard to the results obtained by the guns, and their employment leads to a considerable saving in ammunition, as the information they supply enables batteries to bring an effective fire to bear upon the right targets at the right time.

3. *Telephones.*—Telephones have proved altogether indispensable, and the importance of efficient training in their use cannot be too strongly emphasized.

It is, perhaps, too generally assumed that any man is able to make use of a telephone without special training. This is, however, by no means the case; satisfactory results can only be obtained by men who have been regularly instructed in the art of speaking through the

telephone. As many men as possible should be trained to use the buzzer, as it has been found that communication can often be maintained by its use when telephoning by voice fails. Long distance work up to 1 or even 2 miles should be practised.

4. *Laying Out Lines of Fire.*—It is most essential that all officers should be trained in all the different methods of obtaining the line of fire. Special attention is called to paragraph 198, Field Artillery Training, 1914. Officers should be familiar with all the different methods therein described. Experience has shown that lines of fire must often be obtained by compass bearing or from the map. The following is a method which has proved successful at the front:—

A report is received that a hostile battery has been located by an aeroplane near a certain definite point upon the map. The battery in question cannot be seen from any point in our position, but fire is inflicting considerable damage upon our troops, and it must therefore be engaged.

The battery commander detailed to engage it takes his map, marks off on it the positions of his own and of the hostile battery, measures the angle which his line of fire makes with the true North, ascertains the angle which it makes with magnetic North by adding the magnetic variation, measures the range, notes the difference in level between his battery and the target by reference to the contours, and works out the angle of sight. Having thus obtained the line of fire, angle of sight and range, the battery commander can now, by applying the procedure described in paragraph 198, Field Artillery Training, 1914, open fire in the required direction with an approximately accurate range, and the method of searching and sweeping may be most suitably employed. There is obviously a considerable element of chance in this procedure, but, though the effect is often never ascertained, good results are known to have been obtained on certain occasions. Fire which has been opened in this way has sometimes been the means of indicating the target to an observing officer, who can telephone back the results and carry on the control of the shooting.

5. *Waste of Ammunition.*—Great stress should be laid during training on the necessity of husbanding ammunition, more especially in the case of howitzers and heavy guns.

Continuing to fire too long at the same target is a not infrequent source of waste of ammunition. If the range of a hostile battery has once been obtained and if the battery has been compelled to cease fire, it may generally be assumed that all its *personnel* have taken cover, and that a continuance of fire is only waste of ammunition. It is preferable to register several targets and to fire a few rounds at each of them at intervals; by this method some of the *personnel* will probably be caught in the open and will be destroyed before they can regain cover. In cases where several targets have thus been registered, it has been found useful to have the line of fire of one gun laid out on each target. A few rounds can then be fired with great rapidity on any particular target, or if a heavy and sustained fire is required on it, the lines of fire of the whole battery can be brought on to it by the procedure described in sub-paragraph 4 of paragraph 198, Field Artillery Training, 1914.

6. *German Fire Tactics.*—A *résumé* of some "Orders for the Conduct of Artillery Fire," issued by the German Great General Staff, is given in Appendix II.

7. *Officers' Equipment.*—Some notes on the equipment of artillery officers, which have been furnished by an officer at the front, are given in Appendix III.

### III. DIVISIONAL SIGNAL COMPANIES.

#### (a) SUMMARY OF REMARKS IN A LETTER FROM AN OFFICER AT THE FRONT.

1. *Messages.*—The first and most important point is to keep a careful watch on all messages despatched so as to know at the earliest possible moment whether or no important messages have reached their destination.

There must be one man permanently on duty keeping the register; at least three men therefore must be trained in the keeping of it. Practice in looking after messages in this way is most necessary. The success or failure of an operation may depend upon it.

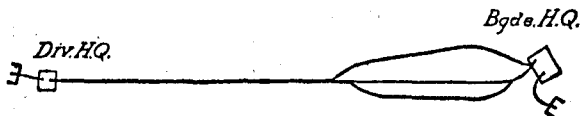


Messages may go wrong in the following ways:—

- (1) Orderlies may be shot, lose their way, or break down.
- (2) Messages may be sent by wire to the cable waggon while it is temporarily out of touch with the Brigade Commander. This can only be discovered if the message ends "acknowledge." All important messages should therefore do so, and the signal officer should add this word if he thinks it desirable.

2. *Cable Lines*.—Detachments must be made to lay cable lines safely by day or night. On nearing his destination, it is advisable for the detachment commander to go forward to choose the route for the cable waggon. Brigade Head-quarters are often exposed to shell fire and it may be advisable to leave the waggon and finish the line by hand. If left down for any length of time, lines must be constantly patrolled and made as secure as possible.

Lines are often cut by shell fire; if a position is occupied for any length of time, duplicate or triplicate wires are useful. These need not necessarily run the whole way, but only along the exposed portion, thus—



Lines are sometimes tapped by German spies, and it is impossible to know when this is being done. It is, as a rule, only done during darkness. Messages should therefore be carefully scrutinized before despatch, and any that relate to movements timed to take place some hours later should be sent by motor cyclist whenever possible.

Clerks should be practised in working with three or four officers on the same line.

#### (b) NOTES ON TRAINING A DIVISIONAL SIGNAL COMPANY.

1. To get the best results out of a divisional signal company it is essential that there should be the closest

co-operation and mutual assistance between the head-quarters and the brigade sections. For example, in the field, the lines from brigades to battalions are often 3 miles long—or even longer, if it is necessary to take a circuitous route to avoid shell fire, and it is necessary to assist the brigade sections by laying D 5 cable for a portion of the distance to the battalions.

The right spirit can only be obtained by the company being trained as a whole, and by the Commanding Officer taking as much interest in his brigade sections as in his cable section.

2. Taking the various portions of the company in turn—

(a) *Head-quarters.*—The head-quarters provides the signal office staff, despatch riders, any visual terminals required, and orderlies. If, however, visual is being used, it is necessary to apply for infantry orderlies in addition to be detailed for the signal office. The mounted despatch riders are usually required in wet and muddy weather, and to convey messages across country during an engagement. They should be able to ride their horses over open ditches about 7 to 10 feet wide, and their horses should be trained to leave other horses without delay.

Motor cyclists are unreliable when the roads are greasy, especially over Belgian pavé. If they have to go to a head-quarters which is in possible view of the enemy, they should leave their machines under cover and walk the last part of the way, as despatch riders going to and leaving a head-quarters are always liable to give away the position to the enemy. They should not be sent out by night unless the exact position of the unit to which they are to go is known. It is difficult for a motor cyclist to find units in the dark unless the exact position can be explained to him. Also he is liable to run into the enemy.

The supply of petrol, oil, and carbide for motor cyclists must be carefully watched.

Cyclists can often be used when the roads are too bad for motor cyclists.

They should be carefully trained in the care of their machines. A number of machines have been broken by horses; cyclists should therefore be taught to put their machines where horses are unlikely to be taken.

All signallers and despatch riders in head-quarters must be instructed in the organization of a division, and of its various staffs and head-quarters. Messages have to be delivered from the signal office to the heads of the administrative services and to such units as divisional train, field ambulances, &c. As soon as possible, therefore, cyclists should get to know the names of the various staff and administrative officers.

The signal clerks and motor cyclists must, in addition, be instructed in the organization of the higher formations of the army in the field, including cavalry.

In billets—and divisional head-quarters are practically always in billets—a list must be kept in the signal office of the addresses of the various people to whom messages have to be delivered, who are usually as follows:—Head-quarters Divisional Royal Artillery, Head-quarters Divisional Royal Engineers, Assistant Director of Medical Services, Assistant Director of Veterinary Services, Cyclist Company, Divisional Mounted Troops, and occasionally Head-quarters, Divisional Train and Divisional Supply Officer. Record must also be kept of the exact positions of brigade and corps head-quarters, and "Corps Signals" must be informed as to the exact position of divisional head-quarters.

As soon as possible after going into billets, brigade signal officers must send in a cyclist orderly to the divisional signal office to describe exactly where the brigade signal office and head-quarters are situated. Valuable time may be wasted looking for a brigade head-quarters in a village unless the exact situation is known.

(b) *No. 1 Section*.—Operators should be instructed in the organization and names of the units in a division. Owing to the danger of German spies tapping the lines, speaking on the telephone should not usually be permitted. Linemen should be trained to act as mounted despatch riders, and should also be able to ride bicycles. A lineman on a motor cycle or bicycle can often be used instead of a mounted man to repair quickly a fault, the probable locality of which is known, e.g., a place which the enemy have been shelling. They are also more useful than mounted men for work on permanent lines.

Cable lines should not be run out till really necessary. The enemy are in the habit of shelling roads, so it may

often be necessary to run the cables across country to avoid having it continually cut. In the presence of the enemy it is usually advisable for the cable detachment to return to divisional head-quarters after laying a line, thus avoiding needless risk. This is possible since, in practice, brigade head-quarters seldom move at short notice during an action. Cable is more often laid by night than by day, lines having to be run out after the division has halted for the night.

It is rarely necessary to lay cable at a trot, although at Le Cateau cable had to be laid across open country for 2 miles at the gallop. The point which is usually most important is to lay the cable safe from traffic. At the time the cable is being laid, or as soon after as possible, it should be fastened high up in trees, to houses, or to telegraph poles, or poles for poling it may be cut in the nearest wood. Iron staples are often useful for quickly fixing the cable to trees, &c.; they should not be hammered in too tightly. If the cable is left on the ground for any length of time it deteriorates and the signals become weak. Climbers should be carried on every cable waggon.\* Permanent line should be used as much as possible in order to save cable.

When laying cable in possible view of the enemy, a hand barrow should be used, as a cable waggon would certainly be shelled. The hand barrow can often be used with advantage also for laying short lines at night, for getting along crowded roads, and for cross-country work. A convenient "barrow detachment" consists of a non-commissioned officer and two sappers, dismounted, a limbered L.S. waggon with hand barrow, ladder, climbers, two drums of cable, and proportion of pole crossings, &c. The waggon would be left under cover when necessary.

(c) *Nos. 2, 3, 4 Sections.*—The rules laid down for the divisional signal office should be carried out in the brigade signal office as far as possible. The head-quarters of the neighbouring brigades should be ascertained from the divisional signal office. All the *personnel* in a brigade section should be imbued with the

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\* Arrangements have been made to include these in the equipment of cable units.

fact that the most important means of communication in possession of a brigade section are the telephone, cyclist despatch riders, and foot orderlies. All the *personnel* in the telephone detachment, less drivers, should be trained to read the buzzer up to at least twelve words a minute with reasonable accuracy. Selected men should be trained in minor repairs, especially in replacing broken leads.

Much practice is necessary in laying lines at night, both on roads and across country. Long lines are often necessary as long range guns compel brigade headquarters to be some distance behind their units. The result of shell fire on lines may also render a detour of some miles necessary. The most important points with long lines are to keep telephones dry and in as good repair as possible, and cable in good condition. D 1 cable should be raised off the ground as much as possible. Linemen should be trained to be very active, and to be able to locate and repair faults quickly by day and night. Cable may have to be abandoned, but drums should be saved at all costs, since it is easier to replace cable than drums. The hand carrier bar is far more used for laying than the pack equipment. Detachments should be instructed in tapping permanent lines and in the use of climbers.

Bicycles must be looked after daily, like a horse, and kept clean and oiled. Cyclists and foot orderlies must be trained to find their way across country on verbal instructions only, though map reading is, of course, very important. Foot orderlies have often to work under fire, and should be instructed to recognise covered approaches. All concerned must be imbued with the idea that a message has got to get through as quickly as possible somehow, even at serious risk to themselves.

3. *Visual Signalling*.—Visual signalling is often invaluable, but it must be concealed from the enemy. It is of no use attempting to use it except with expert, intelligent, and experienced signallers; no others can get messages through. The white flag can rarely be used on service, and men under training should not be allowed to use it; blue flag morse and semaphore read through a telescope, and the heliograph, are far the most important methods.

## IV.—INFANTRY.

1. *Attack Formations.*—Small columns in what are known as "artillery formations" should never be adhered to when there is a possibility of their coming under close or medium range fire of infantry or machine guns.

Troops have suffered severely from insufficient extension, and the adoption of rigid lines, and also from pushing forward in close formations without taking the proper military precautions. Loose elastic formations adapted to the ground with men at 8 or 10 paces intervals are the least vulnerable.

2. *Defence.*—The enemy's night attacks are made without scouts or advanced parties, and the advance is made with great rapidity. Infantry in trenches must always be ready to open a burst of rapid fire at a few seconds' notice; so long as this can be done there will be no chance of a trench being rushed. Supports should be in the cover trenches, and when the firing line is attacked should not fire but rely on the bayonet.

Piquets should be strong at night, and protected by an obstacle (e.g., by a barricade on a road), and the ground on the far side of the obstacle must be under fire from the piquet. The piquet must also be posted on the ground on which it intends to fight, and must be ready to open fire without moving.

3. *Occupation of Villages.*—Villages and farms have been the scenes of heavy fighting. They naturally afford good targets for artillery, and it is better to hold a position in rear of a village, commanding the exits, than one in front of it. Buildings are of course untenable under artillery fire. Wounded should never be placed in churches, as these buildings always form a target for German artillery.

Troops or transport in rear of the fighting line should not assemble in villages within range of hostile guns if it can be avoided, at any rate, in the day time. Many losses have been thus incurred from long range high explosive shells.

4. *German Infantry.*—Our Infantry has proved itself superior in every respect to that of the enemy. The shooting of the German infantry is poor, and the men will not face the bayonet. Unless they are supported by a superior artillery fire, they have no chance against British infantry either in attack or defence.

5. *Care of Rifles.*—New rifles are inclined to work somewhat stiffly at first, owing to slight roughness of the bearing surfaces of the bolt and bolt way. This can be appreciably lessened by frequent and systematic manipulation of the bolt, the bearing surfaces being well oiled. Primary extraction (i.e., the first loosening of the fired cartridge in the chamber) can be improved by placing a fired case in the chamber and working the bolt lever up and down without drawing back the bolt.

Rifles must be kept clean and well oiled, and it has been found necessary to make an inspection daily or even oftener. Particular care must be taken to see that the chamber is scrupulously clean; if it is permitted to become dirty great difficulty in extraction is likely to be experienced.

When in trenches in wet weather every precaution must be taken to prevent the bolt of the rifle from becoming clogged with mud. Much care is required to prevent this occurring.

It has also been found that cartridges get rusted into their clips, and that they should be moved at least weekly. Magazine springs may also become weak if the magazine is continually kept loaded with ten instead of five rounds.

6. *Machine Guns.* — The German guns are usually posted singly or in pairs, and frequently wait for an opportunity for surprise by opening fire with great effect at close range. The enemy display great skill in posting machine guns on a flank so as to bring enfilade fire to bear on the attacking troops.

In village fighting these guns have been especially effective; they are placed in the upper storeys of houses and in similar positions.

In the attack on our positions these guns have been brought forward sometimes by "snipers" before the infantry advances; cases have even occurred in which they have brought guns into farm buildings 10 or 15 yards in front of our trenches and have rendered the latter untenable.

Machine guns are easily put out of action by artillery fire; great care is therefore necessary in selecting positions for our own machine guns, and in occupying them without attracting attention.

7. *Musketry.*—Some notes on German views on musketry and machine guns are given in Appendix IV.

(b) EXTRACTS FROM A LETTER FROM A STAFF OFFICER  
AT THE FRONT.

1. The Germans usually attack about 3 p.m. or at dusk, and then entrench during the night within 200 yards of our lines; they also take advantage of fog in the early morning. They make a little progress occasionally in this way, but it is slow work and they have lost enormously. They shoot badly with the rifle, and nearly all the damage is done by artillery fire and machine guns.

2. As far as our infantry is concerned, there is never any difficulty about seeing the target. Fire is seldom opened at greater ranges than 500 yards, and when the Germans come on in close formation rapid fire at 200 and 300 yards causes enormous casualties in their ranks. Fire direction and control has been, therefore, a simple matter, and the value of elaborate training in these matters has not been apparent.

3. Cover from view has become more important than field of fire. It is better to have a field of fire of 100 yards and to be invisible, than to have one of 600 yards and to be an easy target for artillery.

4. Owing to the enemy's artillery fire by day, digging is nearly always done at night, and this requires much practice. Some sort of rough cover from shrapnel and head cover are added if time allows, and also if they can be made without making the trench conspicuous.

5. The principal subjects of training required by infantry are, in order of importance:—

- (1) Entrenching, especially in the dark.
- (2) Rapid fire.
- (3) Cover from view of artillery for the trenches.
- (4) Bringing enfilade fire to bear on the enemy's trenches whenever possible.
- (5) Skilful use of machine guns. Infantry must be careful when advancing that an enemy's machine gun is not hidden on the flank ready to open enfilade fire. Some regiments have lost very heavily from being caught in this way.



## V.—ENTRENCHED POSITIONS.

### (i) ORGANIZATION.

1. *General Line.*—The general line of an entrenched position is determined by the strategical or tactical situation.

2. *Exact Line of Defence.*—The exact line to be occupied is determined by a detailed reconnaissance of the ground.

3. The entrenching of the line selected should, if time permits, be effected by successive steps, as follows:—

(a) Any well-defined locality of tactical importance in or near the actual line should be strengthened by means of trenches, provided that its position does not introduce dangerous salients or re-entrants to the general line.

(b) As a rule a line selected for defence will contain a sufficient number of well-defined points to facilitate the siting of intermediate localities, and the latter should be next entrenched.

(c) When all the defined localities have been put in hand, the defence of the intervals should be considered in detail.

4. The principles governing the construction of these defended localities are laid down in Field Service Regulations, Military, Engineering, Part I., and Manual of Field Engineering.

The following are some of the points to be attended to:—

(a) Each defended locality consists of a series of trenches which enclose the area to be defended, but are so dispersed that they do not form a concentrated target for artillery.

(b) The localities should be so chosen that the interval between any two adjacent localities is swept by the effective fire of both. The distance between two localities is, therefore, determined by the nature of the ground, but 800 yards may be regarded as a maximum under very favorable circumstances.

(c) In very close country it will be necessary to effect the defence of the intervals by means of a continuous line of trenches.

- (d) The garrison of a locality of course depends upon its area, but every locality should be constructed to accommodate one or more complete units, i.e., section, platoon, company, &c.
- (e) The works of the defended localities should consist of trenches, cover trenches, and support trenches, and the design should follow the lines suggested in "Notes on the preparation of an entrenched position."

## (ii) PREPARATION.

*Siting of Trenches.*—Whenever possible, trenches should be sited so that they are not under artillery observation.

This point is regarded as of great importance, and an extensive field of fire is a secondary consideration.

Trenches should therefore be sited having regard to possible "observation stations" on ground occupied by the enemy, and not solely with regard to the possible artillery positions of the enemy.

In open country it is better to select "a back position," behind the crest of a hill, with a field of fire of 300 or 400 yards. This compels the enemy to expose his infantry to our rifle and shrapnel fire and affords his guns little opportunity of observation. Such positions were held on the Aisne with slight loss to our troops and heavy loss to the enemy. A field of fire of 100 yards is regarded as satisfactory if it cannot be increased without loss of concealment from artillery observation.

*Design of Trenches.*—Fire trenches should be of the recessed and traversed type, as described in the *Manual of Field Engineering*, whenever time permits. They must be deep, narrow, and with low command. (See sketches.) The rifle, when resting on the parapet, must sweep the ground immediately in front.

Strong traverses should be provided every 6 or 8 yards to localize the effect of high explosive shell falling into the trench, and also to give protection against enfilade fire.

All excavated earth must be concealed. Earth not required for the parapet should be placed behind the trenches to afford protection against the back blast of

high explosive shells, provided the trenches are not rendered conspicuous thereby.

Elbow rests should be either dispensed with or made as narrow as possible. Most men, however, prefer making their own niches for the forearm to rest against.

Recesses under parapets must be shored up. The bottom of the recess should be above the level of the bottom of the trench so that in wet weather the seat so formed will remain dry.

Head cover and overhead cover may be provided when concealment is not sacrificed thereby, and when trenches are not in positions liable to be rushed. They must in no case restrict the free use of the rifle. With overhead cover a continuous loophole is the best form.

When other types of loopholes have been used, the tendency has been to make them too small, and, more especially, too narrow.

Drainage must be provided.

*Hedges.*—When siting trenches behind hedges, they should be brought up as close as possible to the front edge of the hedge; to do this the hedge should be trimmed from behind as far as possible to the front, without interfering with the general appearance of the hedge as viewed by the enemy.

*Cover Trenches.*—A second row of trenches should be dug in the rear of the fire trenches, to which the men may retire during bombardment, the fire trenches being held by as few men as possible.

These trenches may be of design somewhat similar to that of the fire trenches, and should be connected with them by zig-zag or concealed approaches, and can be quite close to the fire trenches (25 yards).

Latrines and dressing stations should also be provided in these trenches.

The use of overhead cover makes it difficult to ascertain from the air if trenches are occupied or not. Overhead cover is therefore well suited to cover trenches. Dummy trenches are most valuable, especially if they can be made to appear occupied to an aeroplane observer.

*Obstacles.*—Barbed wire entanglements or other obstacles should be from 20 to 50 yards in front of the trench. In positions where there is a liability of the trench being rushed sentries may be placed in rifle pits

in the entanglements. Where woods run into the position they should be entangled on the near side as much as possible and the undergrowth cleared.

*Field of Fire.*—When the field of fire is cleared care should be taken that trees are cut down as near as possible to the ground, otherwise they provide cover for the enemy, in an attack, and at night may be mistaken for men approaching.

*Visibility of Trenches from Aircraft.*—Straight lengths of trenches are the most conspicuous. When hedges have been utilized trenches are almost invisible; those dug across the middle of ploughed fields are easily seen. Communication and approach trenches attract the eye of the observer first. The position of a trench has been disclosed on several occasions by straw, ration tins, &c., left lying in its immediate vicinity.

The German trenches are more visible than ours as they are generally longer and more regular, and their communication trenches are more elaborate.

It is very difficult to see if trenches are occupied or not, especially the German trenches.

It is also very difficult to see if a gun is in position in an emplacement or not, especially if hedges and trees are utilized for concealment. German guns are frequently in the open. Tracks across grass, plough, &c., leading up to gun emplacements are always very conspicuous, and if dummy emplacements are made tracks should be made leading up to them.

*General Notes.*—It is essential that all men should be taught to dig quickly with their entrenching tool, by night as well as by day.

The great importance of a proper system of local protection whilst digging has been overlooked on more than one occasion. In one instance, even, a battalion was surprised while digging with arms piled and no scouts out.

The effect of shrapnel fire against recessed trenches provided with head cover is very slight. High explosive shell have only a very local effect if traverses and small parados are provided.

## VI.—ARMY SERVICE CORPS.

Transport units, especially mechanical transport, are often halted at a distance from fighting troops and have

to protect themselves. The *personnel* should be organized for fighting and proper measures for protection should be taken at every halt. Particular care is required to keep the rifles free from rust and dirt in these units, in which it has been found that these precautions are liable to be neglected.

## VII.—BILLETING.

The following procedure has been found to work well in moving troops into billets:—

1. An area is allotted to a division, the General Staff of which allots the areas to troops from the map and informs the Quartermaster-General's branch. The latter are responsible for issuing the necessary orders to headquarters of brigades and divisional troops except as regards protective measures which are the concern of the General Staff.

It is often advantageous for the position of divisional and brigade head-quarters to be fixed in orders by corps and divisional head-quarters respectively.

2. The billets are usually allotted in "brigade areas," one for each infantry brigade, with probably a field artillery brigade and a field company attached. The remainder of divisional troops, including brigade ammunition columns, field ambulances, and trains are generally allotted to "brigade areas," as convenient; or they may be grouped in a separate area for which arrangements can be made by head-quarters divisional artillery. The divisional ammunition column and train frequently halt some miles in rear and have independent billets.

It is advantageous to affiliate Royal Artillery brigades and field companies to infantry brigades permanently for billeting purposes.

3. As soon as orders allotting billeting areas have been received, the head-quarters of each infantry brigade sends forward its billeting officer with the billeting parties (if possible mounted on horses or bicycles) of all units in its area. Each Royal Artillery brigade must send an officer to assist the infantry brigade billeting officer in allotting billets for artillery units.

4. The procedure in billeting troops in a village is as follows:—The billeting officer, who is accompanied by an interpreter, proceeds to the house of the *Maire*, who

will give every assistance, and supplies a list of the billets available on which the allotment is made with as little inconvenience to the inhabitants as possible.

When in contact with the enemy, the villages will usually be found practically deserted. In these circumstances it may be necessary to break open the houses to provide shelter for the troops, but the sternest measures must be taken to prevent any wanton damage or looting. When it is necessary to take any food, fuel, &c., the brigade requisitioning officer should be informed and should authorize whatever is necessary.

5. It is of great importance that representatives or orderlies from all units in a "brigade area" should remain at the brigade area head-quarters for the purposes of taking orders to their own units.

6. Divisional and brigade head-quarters should always be situated in a place where they can easily be found and communicated with.

It should be possible for messengers to find the head-quarters of any unit easily, either by day or night. If near a road, which is best, a sentry should be posted, and at night a lamp should be placed *on the road*, so that the messenger must see it as he passes. The sentry over a head-quarters must, of course, know where the officer responsible for receiving messages is to be found.

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## APPENDIX I.

## A FEW NOTES BY A CAVALRY OFFICER.

*Officers' Kits.*—We none of us carried water bottles although the weather was very hot, and we never wanted them.

A strong haversack is necessary; the ordinary khaki drill haversack is not strong enough. A good cartridge bag would be the thing.

Wire cutter very necessary. The Government ones are good and cut the strong "bull" wire well, of which there is a lot.

I spent £2 in a month and need not have spent half as much. One should get one's money changed as soon as possible as they do not like taking English money.

*On Horse.*—Built up rope, one peg, two blankets under saddle. Mackintosh or British warm. We carried mackintoshes, but expect, now it is cold, British warm would be better. In wallets—washing and shaving things, brushes and towel, knife, fork, and spoon, mug, pair of woolly socks, electric torch, scarf, and a spare shirt, if there is room. Two blankets under the saddle are essential—one for the man and one for the horse. A dry one next to the skin will often save a sore back.

*Men.*—Wore their water bottles out a lot. Gave away all their badges and numerals as souvenirs to the girls. This is a great bore. We made them all pencil them on with indelible pencil.

Must have a "built-up-rope" as most of the tying-up is to a headline threaded breast high along the pillars of barns, &c.

Water buckets are very useful as one has to use them every time at rivers and canals, into very few of which one can walk horses.

Nothing should be carried in the water buckets. We had to have a general order to that effect. It wears them out and increases the weight.

Stop men collecting "trophies of the chase"; they are too heavy and are very easy to get as the Uhlans throw away their lances on the slightest provocation.

Men are very apt to sit up to all hours and buck even after a very long, hard day with an early start next morning, with the result they are dead tired and sleepy next day. This is a bad nuisance, and wants suppressing.

The men are very fond of eating their emergency ration when there is no need for it. This should be stopped as supplies are good and regular, but must fail sometimes.

*Horses.*—We did not carry cornsacks; the supplies were very good even in the retreat. If the nosebag is filled up on each opportunity it should suffice.

Shoes wear out in about a fortnight as many of the roads are cobbles; so an adequate supply of spare shoes and good farriers are very necessary. Ours had the devil of a lot of work and did it most awfully well.

Most farms have hay or oat straw; the facilities for watering are not good or frequent, and should be made the most of.

Brand all your horses on neck or shoulder. A quick man can do them almost as quick as they can file past.

## APPENDIX II.

### RESUME OF "ORDERS FOR THE CONDUCT OF ARTILLERY FIRE" ISSUED BY THE GERMAN GREAT GENERAL STAFF.

#### *New Regulations for the Conduct of Artillery Fire.*

These are necessary because—

- (1) The lessons of the war do not agree with the methods and instructions adopted in peace time.
- (2) The maximum output of German factories cannot supply our armies with ammunition to an unlimited amount.



## Main points—

- (i) Only to fire at *targets that are worth while*.

To suit the projectile to the result to be attained.

Nor to fire during the night (owing to the impossibility of locating the fall of the shell).

- (ii) To *concentrate fire*, both as regards time and space, so as to ensure the maximum physical and moral effect.

To combine as far as possible frontal and enfilade fire.

To utilize rapidity of fire; slow fire is without effect and a waste of ammunition.

- (iii) The importance of *direct observation*. If this is impossible, employ aeroplanes, captive balloons or observers on a bank. Avoid "*searching and sweeping*." If this is indispensable conduct it within fixed limits, otherwise it is a waste of ammunition.

- (iv.) *Co-operation with the infantry* is of the very greatest importance.

Regard for co-operation must guide the artillery in its selection of positions. Generals of Divisions must ensure that this co-operation is effective. They are responsible that it is maintained.

*In attack*, to prevent the infantry coming under the fire of hostile artillery. If concealed batteries cause losses to the infantry they must be located by aeroplanes. As soon as the infantry advance portions of the artillery must turn their fire on the hostile infantry.

Develop the maximum intensity of fire immediately before the assault.

Strong positions (defended villages, &c.), are ready to be assaulted after a bombardment of one or two hours. If the assault does not follow immediately on the bombardment, the latter is waste of ammunition.

*In defence* choose your time. A long cannonade is a waste of ammunition.

## APPENDIX III.

NOTES ON THE EQUIPMENT OF ARTILLERY OFFICERS  
(FURNISHED BY AN OFFICER AT THE FRONT).

Every officer ought to have, in addition to No. 6 or No. 8 Zeiss graticuled glasses, the following:—

A good map case—the expanding ones are best—to carry extra maps, papers, message forms, &c.

A prismatic compass.

A wrist watch.

A spare watch.

J. H. Steward's celluloid semi-circular protractor.

J. H. Steward's 1/80,000 and 1/100,000 yard scales—ivory; the wooden ones chip and break.

Two or three small note-books.

Pocket dividers.

Pencils—plain, copying, red and blue chalk.

## APPENDIX IV.

## GERMAN VIEWS ON MUSKETRY AND MACHINE GUNS.

These notes are from a recent conversation with a German machine-gun battery commander, an expert in both musketry and machine guns. They are the views apparently held in the German army before the war, and on which their training has been based.

1. *Musketry.*

(a) *Range.*—The Germans consider it unnecessary to teach men to fire at distances beyond 400 metres. The plan of attack (see paragraph 3) is devised to get within this range without opening fire.

(b) *Fire Control*.—Judging distance is practised by officers only, and no attention is devoted to indication of target, concentration, &c.

(c) *Concentration*.—To concentrate the fire of a platoon or company on one spot at 1,000 yards range is considered to be a great waste of ammunition. The nearest they do in this way is to fire by battalions on large areas of ground, using independent fire. On the Aisne this officer's machine-gun battery came under concentrated fire of our infantry at 1,000 yards, and his men suffered heavily from it, but they could not see our men to reply.

(d) *British Musketry*.—Our musketry, this officer said, was marvellous. They had counted on being able to rush us by weight of numbers (*vide* plan of attack, paragraph 3), and found themselves quite unable to do it because our fire was "so straight and so quick."

(e) *Rate of Fire*.—When asked if the Germans went in for rapid fire, he replied that only some of their men were practised, and they only averaged eight to nine rounds per minute. (Their straight bolt is not so easy to work, nor is their clip so easy to put in.) They do not seem to realize that we train our men to fire fifteen well-aimed shots a minute.

## 2. Machine Guns.

Each battalion has a company of four and sometimes six machine guns. Every man in this company is an expert in the gun. Each gun is considered to be worth 50 men or more. Their fire is considered to be the most valuable form of discharging bullets, and an enormous amount of time, trouble, and ammunition has been expended on machine gun training.

*Training*.—The Germans never worry about different elevations, combined sights, or traversing, and never fire on a 30 yards' range, which is considered useless for training purposes.

Machine gun competitions are looked on as far more valuable than rifle competitions.

*Tactical Employment*.—In the attack the machine guns are brought up with supports, and, until the war had been going on a month, it was not thought worth while to "dig in" the guns, as their tactical employment was essentially with the infantry.

### 3. *The Attack.*

The following gives a rough idea of the method of attack in the German army as explained by this German officer—

	Machine gun.	Machine gun.	Machine gun.	Machine gun.
3rd line	.....*	.....*	.....*	.....* Rear rank.
	.....	.....	.....	..... Front rank.
2nd line	.....	.....	.....	..... Rear rank.
	.....	.....	.....	..... Front rank.
1st line	.....	.....	.....	..... Rear rank.
	.....	.....	.....	..... Front rank.

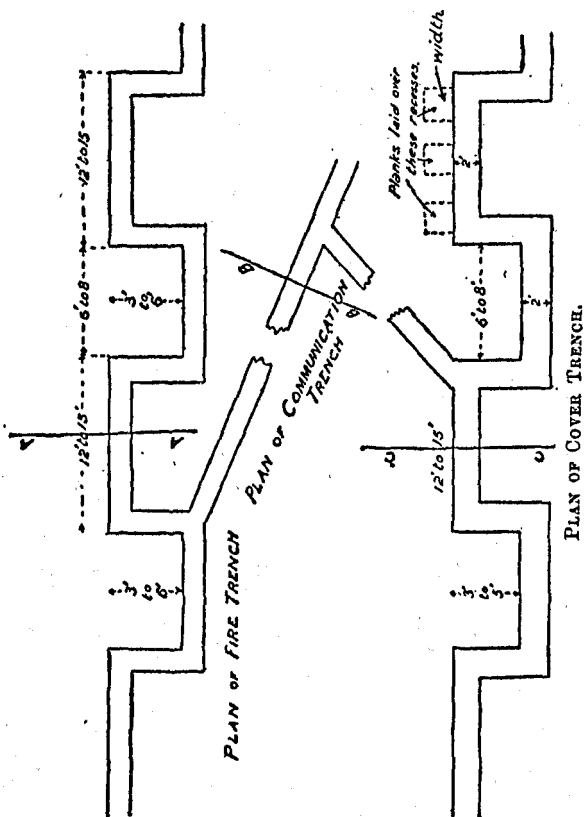
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The first line is looked on as "cover" from bullets for the second and third lines to enable these two lines to get closer with the minimum of loss.

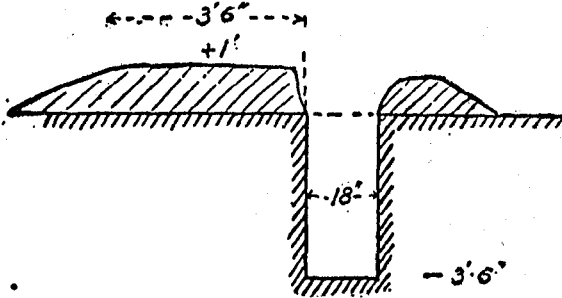
They reckoned on their third line with their machine guns being able to get within 400 yards. They have, however, never been able to do this over open ground against the British, because their first line was down too soon—sometimes at 800 to 1,000 yards. As this officer explained, they have never had a chance against the British.

They consider mass formation to be the only way to get up close, both ranks of each line being close together. If their third line is held up they have standing orders to dig in at once, and for this purpose the third line carries shovels and small picks.

# SKETCH OF TYPE TRENCHES.

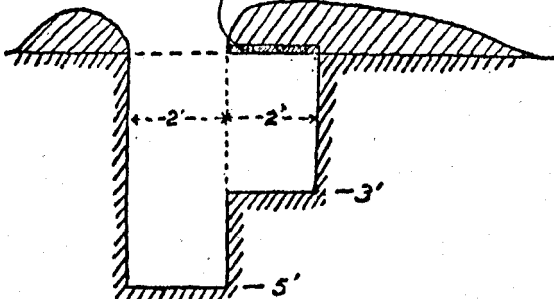


TYPE I.



SECTION OF FIRE TRENCH A.A.

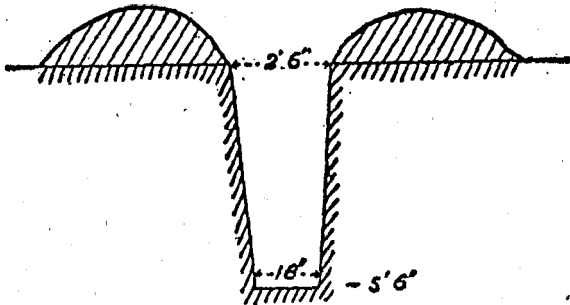
TYPE II.

*Planks*

SECTION OF COVER TRENCH O.O.

(This may be covered over in places if material is available.)

## TYPE III.

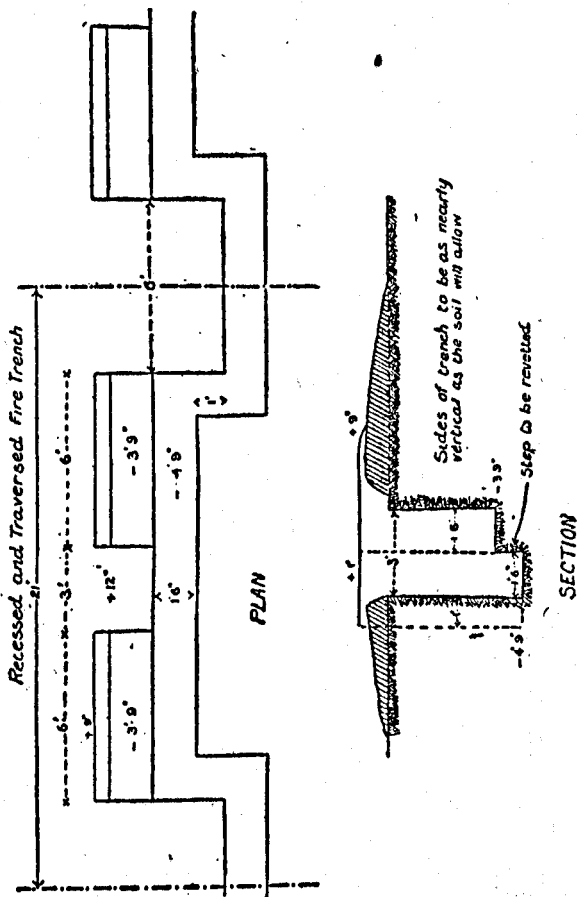


## SECTION OF COMMUNICATION TRENCH B.B.

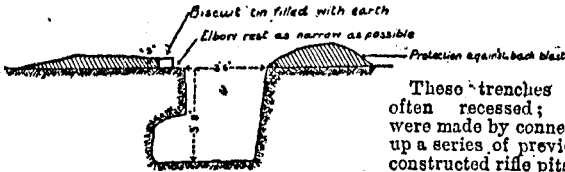
*Notes on the dimensions of Fire, Cover and Communication Trenches.*

1. The distance between traverses and their length and thickness depend upon:—(a) Liability to enfilade. (b) Exposure to direct artillery observation or fire.
2. The depth and width of trenches depend upon the nature of the soil, its firmness, and whether it is low lying or dry.
3. Crossing places should be made in communication trenches.
4. Drainage of all trenches is most important.

### SECTIONS OF VARIOUS TRENCHES IN THE AISNE VALLEY POSITION.

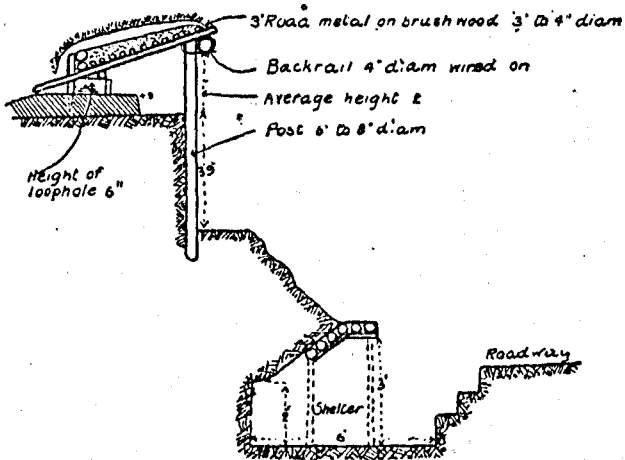


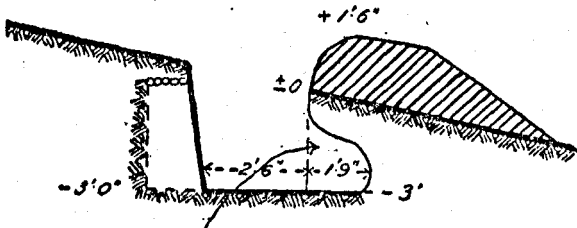
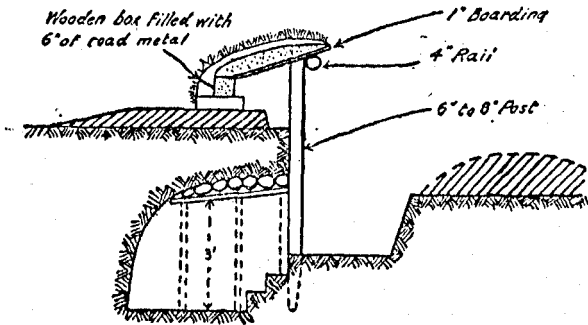




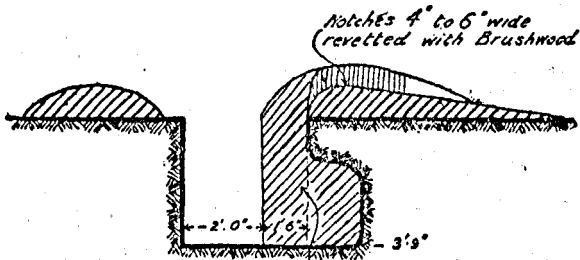
These trenches were often recessed; they were made by connecting up a series of previously constructed rifle pits.

TYPE OF FIRE TRENCH NEAR SOUPIR FARM.

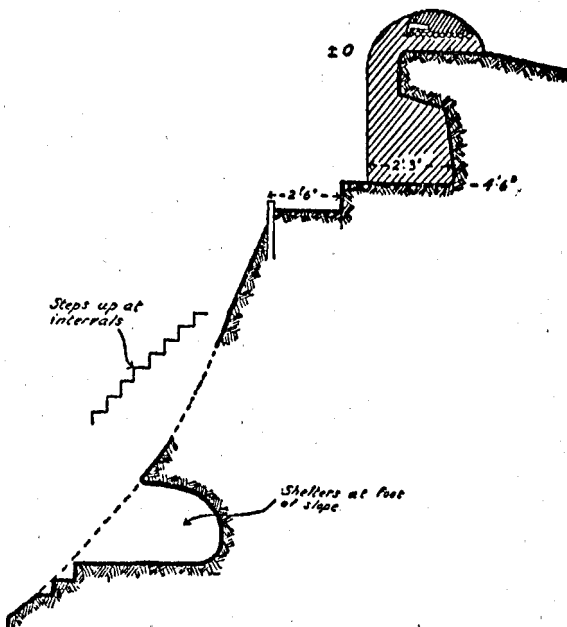




*Recesses under both  
sides of trench.*

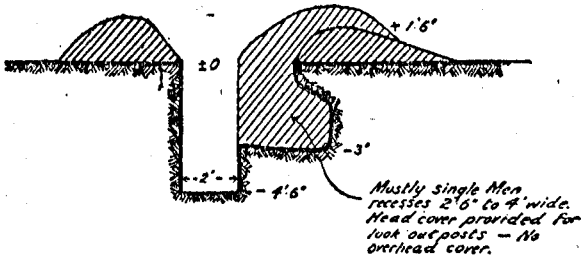
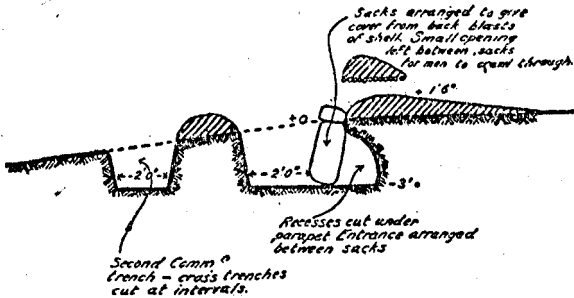


*Man Recesses  
1'8" to 2' wide.*



TYPE OF TRENCHES ON EDGE OF QUARRY.



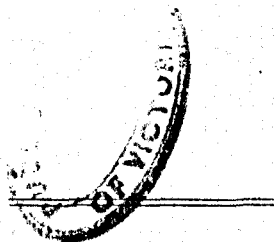


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# NOTES FROM THE FRONT.



COLLATED BY THE GENERAL STAFF.

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1915.

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# NOTES FROM THE FRONT.

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C.16770.

## TACTICAL NOTES.

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### *Notes from a General Officer at the Front.*

#### (a) GENERAL.

1. *Defensive Positions.* —One of the principal lessons of the war, hitherto, from a tactical point of view, is the necessity for screening positions for defence from the enemy's artillery fire. The enemy's artillery is numerous, powerful, and efficient, and our infantry has suffered much from its fire. The German infantry, on the other hand, is inferior to our own in developing fire effect. A short field of fire (500 yards, or even less) has been found sufficient to check a German infantry attack. Tactically, therefore, in occupying ground for defence, every effort should be made to combine the fire of our own guns and rifles against the enemy's infantry, while denying to the enemy the use of his artillery by the siting of trenches in positions which it is intended to hold on to, behind rather than on the crest line or forward slopes.

This does not mean that advanced posts have been found to be of no value. On the contrary, in order that full advantage may be taken of the strength of such positions as described above, it has been found essential to prevent the enemy's rapid approach by the use of advance posts supported by artillery, in order to gain time for deployment and the reconnaissance of the main position, and under favorable conditions for its entrenchment.

2. *Protective Troops.* —It was found necessary during the retreat to provide for the protection of a large body of troops such as a corps by means of protective detachments, flank and rear guards, rather than by an outpost line only. We had not been accustomed to handle large bodies of troops in peace time, and in the early days relied entirely on outposts for protection. It was found that the long range and power of the enemy's artillery kept the troops in constant anxiety of being shelled in their bivouacs, and that when pressed by the enemy in retreat the main bodies were easily brought to action and delayed. When protective detachments at a



distance from the main bodies were employed, the troops rested in greater security and were able to resume the march confident in the ability of the rear guard to hold the enemy off unless very heavily pressed. These protective detachments at a distance from the main body have been found to be especially necessary in the absence of protective cavalry. When this system is combined with billeting in depth, a march can be resumed at any moment without delay, and mobility is greatly increased.

3. *Passage of Rivers.*—Several rivers have been crossed both in advance and in retreat, and experience has been gained both in forcing the passage of a river and in delaying the enemy on a river line. In forcing the passage of a river defended by the enemy's rear guard, it may be useful to remind subordinate commanders that there should be no delay in engaging the enemy at the point or points that he is defending and reconnoitring at once for a point of passage which is undefended. Sometimes boats, rafts, a bridge the enemy has forgotten, a weir, or other means of crossing, have been found. When a sufficient force has been passed over by such means, the enemy, who frequently offers a strong opposition at the defended points, using quite a small force with several machine guns, can be quickly cleared out and a bridge thrown. The Royal Engineers should reconnoitre at once for the most favorable site for a bridge, and can often find and collect materials to supplement the available pontoons. Those with the field companies have twice been found insufficient for the purpose, and the bridging train may not be at hand.

In the event of its being desired to delay the passage of a river by the enemy, it may not be out of place to draw attention to the necessity of studying the bends of the river and the topographical features of the banks, with a view to ascertaining the likely points at which the enemy will try to cross, and making tactical dispositions accordingly. The re-entrant bends towards the enemy should be brought under artillery fire by establishing observation posts from which they can be seen and artillery fire directed upon them. The throwing of a bridge may thus be prevented, or it may be destroyed after it has been thrown. Detachments should be posted in advance of any main position that it may be intended to occupy, to prevent the enemy from

debouching from the necks of these bends, if he succeeds in crossing. If dispositions of this nature are made with skill, the enemy may be delayed for a considerable time, and, if desired, time can be gained to prepare a position for defence.

4. *Night Operations.*—This corps has not carried out any night attacks, but it has been attacked at night, and it has been found that the enemy apparently makes all his arrangements beforehand, and usually advances in strength, dispensing with scouts or advanced parties. No warning is therefore given of his attack, and to meet it picquets must be strong and on the position on which they intend to resist. There is no time to rouse them and occupy trenches. If a picquet is watching a road at night, the road should be barricaded and the picquet placed so as to bring fire to bear on the road in front of the barricade, and should never be placed in a position where it can be rushed unprotected by an obstacle.

5. *Formations when on the Move.*—It has been found that the long range of the enemy's artillery, combined at times with the weakness, or even the absence, of our own cavalry, has rendered the infantry of advanced guards particularly liable to come under artillery fire in close formation. Not only do the troops themselves suffer on these occasions, but the first line transport has been found to be especially vulnerable. It is very undesirable that the march of the main bodies should be delayed by the constant deployment of advanced guards to avoid casualties. It is, therefore, essential, when the front is inadequately covered by cavalry, that troops should be able rapidly to adopt formation suitable when under artillery fire, and they should be trained to adopt these formations as quickly as possible. No more first line transport vehicles than are absolutely necessary should march with an advanced guard, and it has been found desirable to divide first line transport into two echelons.

When troops are fighting, first line transport, first line waggons of artillery, field ambulances, and ammunition columns should beware of the deceptive shelter afforded by villages. The enemy's high-explosive shell render villages and the vicinity of buildings especially dangerous. Wounded should not be placed in a church during an action. Vehicles and horses should not be

crowded together near points that are easily ranged upon by the map, such as barns, haystacks, and road crossings.

**6. March Discipline.**—Men who have not been with the colours during the last four or five years do not understand the necessity for good march discipline. It should be impressed upon all ranks, and should be resolutely insisted upon at all training previous to arrival in the theatre of war. There has been straggling, no doubt in great measure due to exhaustion during the first phase, but it is most necessary to tighten up the march discipline again, and to prevent undue opening out and straggling.

Horsed waggons should not be parked on the road.

Waggons should never be halted when passing through a village.

When a halt is necessary, it should be made before reaching or after passing a village.

Men accompanying trains should carry their rifles, and should march in formed bodies.

Each unit should detail an officer with a small party of selected non-commissioned officers and men to march in rear of the unit, in order to enforce orders against straggling, leaving the ranks for water, and so forth.

**7. Concealment from Aircraft.**—The enemy's aircraft are numerous and efficient, and it is clear that he obtains by this or other means excellent information as to our movements. It has been found impossible to conceal movements of large bodies of troops when on the march from this observation, and the position of large bivouacs can always be observed from the air. But much can be done to conceal artillery positions and trenches, and the use of overhead cover, as we know from our own experience, makes it difficult to ascertain from the air whether trenches and gun emplacements are occupied or not. Troops should, therefore, be taught to understand the necessity for concealment from aircraft whenever the conditions admit of it.

**8. Machine Guns.**—Machine guns have played a very important part in the war, and the enemy is adept in making use of their surprise effect, which has been found to be very great indeed. Till they are located and engaged, machine guns play havoc with troops in close order, but, when located, they are easily knocked out by artillery fire, or silenced by a concentrated rifle

fire. Great care should, therefore, be taken in selecting the positions for machine guns, in occupying them without attracting attention, and in reserving fire till a suitable opportunity arrives, in order to make full use of their surprise effect. The only way to avoid the surprise effect of the enemy's machine guns is by careful reconnaissance.

#### (b) DIVISIONAL MOUNTED TROOPS.

9. *Reconnaissance Duties.*—The mounted troops allotted to army corps are strictly limited in numbers, and consist of a squadron of cavalry and a cyclist company with each division. Experience has shown that army corps cannot always rely on receiving protection from cavalry, nor can they be sure that information which is essential will be obtained for them by cavalry or even aircraft. In these circumstances, there are many duties to be performed by the divisional mounted troops, and if the strictest economy is not employed they will soon become depleted in numbers, both from casualties and exhaustion.

No reconnoitring detachment should be stronger than is necessary for its immediate purpose, and no reconnaissance should be sent further afield than is necessary to obtain the actual information required. The greatest care should be taken to limit the scope of these missions, and to make instructions clear and definite.

Mounted men should not be kept out at night if it can be avoided.

#### (c) ARTILLERY.

10. *Tactical Handling of.*—Our artillery has suffered from certain disadvantages during the war so far. In the early battles it was outnumbered, while the ground on the Aisne has prevented its close co-operation with our infantry, which has consequently been exposed to a heavy artillery fire that our guns have been unable to cope with, except with the assistance of aerial observation. The enemy's heavy howitzers have been more numerous than, and superior, as regards weight of metal, to our own heavy artillery. The result has been that our infantry have suffered heavy losses from the enemy's artillery fire, and the efforts of our own artillery have necessarily been directed primarily towards neutralizing its effect.

The conclusion has been drawn by some that this should be its primary rôle. There could be no greater mistake. It should be our constant endeavour to rectify this position and, while developing the power of our artillery, to improve our tactical skill in handling it, so that it is not constantly on the defensive, and so that we may employ its power primarily in attacking the enemy's infantry, and so reverse the situation. As already indicated above the first essential to this end in defence is the skilful use of ground. It is hoped that the Army will soon pass to the offensive and that the artillery will then have an opportunity of showing its ability to support its infantry closely and devotedly in attack. Undoubtedly one of the chief lessons of the war has been the necessity for the closest co-operation between the two arms.

11. *Concealment of.*—Concealment has been forced upon our artillery. The enemy's fire is rapid and accurate, and the effects of the high explosive shell from his heavy howitzers is very damaging, not only to personnel but to material as well. Flashes must be concealed from the front and observation posts selected with the greatest care, and occupied with caution. Emplacements must, whenever possible, be concealed from aerial observation by overhead cover, branches or straw.

12. *Cover for.*—Protection must be provided for the detachments, and, if the situation permits, it is advisable to prepare the emplacements before occupying the position.

13. *Observation by.*—For accurate shooting, effective observation is essential. Forward observation must be used, and for this purpose telephones are invaluable, and great care should be taken of them. Telephone wire should be husbanded.

Visual signalling has been little used.

14. *Co-operation with Aircraft.*—Great strides have been made in the co-operation between aircraft and artillery for the purpose of locating hostile trenches and guns and observation of fire. No battery can now be considered really efficient that is not able to range rapidly and accurately by means of aerial observation. The system of coloured lights works well. The new wireless apparatus is better.

15. *Anti-Aircraft Guns*.—The anti-aircraft gun plays an important part, and if skilfully handled both tactically and as regards shooting should be able to prevent the close reconnaissance of a specified area, or the co-operation of the enemy's aircraft with his artillery. Efforts should therefore be made to develop the skill of the personnel.

16. *Ammunition*.—The expenditure of 60-pr. and 4.5/ howitzer ammunition while on the river Aisne has been very heavy. New formations arriving in the theatre of war should be especially cautioned not to waste ammunition of these natures. In battles of position these weapons are evidently destined to play an important part.

17. *Ammunition Columns*.—Roads have often been blocked during operations by ammunition columns. Officers in command of these units should be cautioned to park their horse drawn vehicles off the roads whenever possible.

#### (d.) INFANTRY.

18. *Siting of Trenches*.—Owing to the accuracy of the enemy's artillery fire, it is desirable that ground which is to be held defensively or to assist further advance should be entrenched. Trenches should be commenced at once with the light entrenching tool and improved later as opportunity occurs. They should be deep and narrow and should show above the ground level as little as possible, and all trenches should be traversed at intervals of five to ten rifles. When siting trenches it should be borne in mind that the enemy is adept at bringing enfilade artillery fire to bear from flank positions. At any point, such as a salient, at which trenches are particularly liable to this form of fire, great care should be taken as to their siting and they should be especially heavily traversed. Where head cover cannot be provided, cover from shell fire for the troops when not actually using their rifles, can readily be obtained by making recesses in the trenches on the side nearest to the enemy. It has been found that head-cover or anything that in any way interferes with the rapid use of the rifle is a disadvantage in positions where the trenches have a short field of fire and are therefore liable to be rushed. If immunity from shrapnel fire can be obtained up to the moment of having to resist the infantry attack, no more can be hoped for.

Communication trenches for supports and ammunition supply are necessary, and they should be wide enough to permit of a stretcher being carried along them so as to facilitate the removal of wounded.

Support trenches may be close to the firing line trenches, but should be so made that the men can lie down and sleep. All trenches must be assimilated to the surroundings.

Elbow rests have not generally been found useful.

Protection against high-explosive shells of howitzers is unobtainable in field operations, but this effect can be localized by traverses.

19. *Observation by Aeroplane.*—As soon as it appears that troops have been located by an aeroplane their position should be changed, as it has been found by experience that batteries open fire directly the aeroplane report has been received.

20. *Enemy's Ruses.*—The enemy adopts all manner of ruses to deceive our troops, such as the use of the white flag, or dressing up in the uniforms of the Allies. It is important therefore that any body of troops approaching our lines should be brought to a halt at some distance from them, and one individual only be allowed to advance to establish their *bona fides*. Should they refuse to halt, or act in a suspicious manner, they should, irrespective of their dress or of the circumstances under which they approach, be fired upon without hesitation.

21. *Standing to Arms.*—Troops in contact with the enemy should always stand to arms before dawn ready to move off, and should remain under arms till the front is reported by patrols to be clear.

22. *Fixing Bayonets.*—The enemy's attacks develop so quickly that it is important that troops, and especially protective detachments, should fix bayonets before the final stages are reached. At night, outposts and troops in trenches should have their bayonets permanently fixed. When attacking at night bayonets should always be fixed at the position of deployment.

*Extracts from Letters received from General Officers  
at the Front.*

*Cavalry.*—Up to the present long distance reconnaissance by cavalry has been entirely replaced by aeroplanes, the cavalry work being confined to covering the

immediate front, or to being massed for operations against a flank. The training of the cavalry with the rifle has been invaluable, and has given them great advantage over the enemy. There have been no cases up to the present of large cavalry charges with the *arme blanche*, but the latter has been used a good deal in small affairs.

*Infantry.*—The choice of infantry fields of fire is largely governed by the necessity for avoiding exposure to artillery fire. A field of fire of 300 to 500 yards is quite sufficient. This indicates the necessity for accurate shooting at short ranges. Insist on the training of scouts, and particularly on the training of non-commissioned officers as patrol leaders.

An advance should not be made in rigid lines, but with clouds of skirmishers—5 or 6 yards apart—thrown forward according to the ground and available cover.

The essential thing is to pay attention to the sound principles on which our training has been based.

*Notes received from Officers at the Front regarding the Work of Engineers.*

1. Field Companies have been chiefly employed in—

Bridge demolition.

Bridge repair.

Pontoon and trestle bridges.

Pile driving.

Making approaches.

Assisting infantry in improving field defences.

Wire obstacles.

Preparing positions in rear of fighting line, utilizing civilian working parties.

2. The handling of explosives and pontooning (including heavy bridge) and Weldon trestle work should receive special attention.

3. As regards permanent bridge repairs to take mechanical transport it has sometimes been possible to patch up the disabled bridge. Twenty-five sappers were able, in 60 men-hours, to make four girders 75 feet long, built of wood and iron tie rods obtained locally; these were successfully launched on to a broken pier and the bridge was restored for mechanical transport.



In another case a company drove in pile piers and put up 30 wooden girders to take mechanical transport.

A Field Squadron spliced a demolished steel girder bridge which had been cut through, but the ends of which had not fallen in; the splicing was done with steel bars and chains, and the bridge took mechanical transport.

4. For notes regarding trench work, see under "Infantry."

5. *Signal Companies*.—Considerable use has been made of the permanent lines of the country. Motor cyclists have rendered valuable service, and have proved the chief means of communication during movement. It is essential that they should be expert at effecting ordinary "running repairs."

The telephone detachments have been invaluable; messages are generally sent on the vibrator. During heavy shell fire it has been very difficult to hear the signals, but messages are sent and received between the bursts.

Helio, flag and lamp have all been used effectively on occasions; but great care is necessary to conceal the signaller from the enemy, as when seen a heavy shell fire is directed on him. On one occasion the reinforcements of an infantry brigade were directed to the most hardly pressed point by flag signal from the back of a farm.

*Notes from a Conversation with a Battalion Commander who has recently been Wounded and Invalided Home.*

*Entrenchments*.—It has been found that the best form of entrenchment is a deep narrow trench without parapet or headcover. Parapet and headcover form too much of a mark for the German artillery. Trenches 2 feet wide for "fire standing," with the earth thrown in rear, are recommended. The difficulty of draining trenches has not been overcome. If possible, trenches should be dug to communicate with hollow lanes. When the men are once ensconced in these trenches they have little to fear. A company of the battalion under the informant was fired on all day by all types of German guns, and only one man was wounded. Battalions which have not dug themselves in at once have suffered in consequence.

Shallow trenches constructed with the portable tools are worse than no trenches at all against artillery fire, as they give the German artillery a better target.

When siting trenches by day it is better to occupy a position with a false crest on the enemy's side than to occupy a crest with no dead ground to the front. See Plate V., page 14.

Trenches sited at A will probably not suffer at all from hostile gun fire. Those at B will be "pounded" with great accuracy by hostile artillery.

From A only 1,000 yards field of fire is possible. Field of fire from B is anything up to 2 miles. Of the two A is by far the better, and the German artillery will find great difficulty in locating the trenches.

Electric torches have been found most useful by battalion and company-commanders who possess them. In siting trenches at night it is most useful to send out a man with an electric torch in front of the proposed trench. The man should hold the torch some 2 or 3 feet from the ground, and should gradually move backwards towards the enemy. If this is not done, trenches may be made at night with perhaps a field of fire of only 50 yards.

**Tools.**—Infantry battalions have often been handicapped because the battalion picks and shovels were a long way in rear in a wagon, which has been unable to reach the battalion.

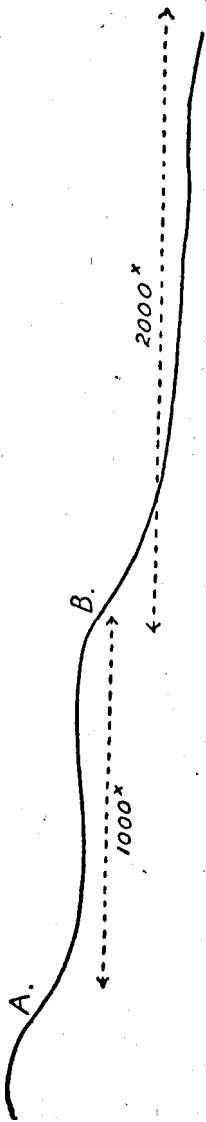
When a battalion is sent forward to secure an important point (e.g., at the passage of a river) there should be at least 200 picks and shovels actually distributed amongst the men before they go forward. The small portable tools are useful, however, for improving a bank or ditch at the side of a road.

Every effort should be made to collect tools from the various farms in the vicinity.

It is essential that telephonic communication should be maintained between the forward infantry and the troops, especially the artillery, in rear.

It struck the informant that intercommunication between the front line and our own artillery is a matter which should receive continuous attention.

## Plate V.



*Operations in Woods.*—Our infantry would be much assisted if accompanied by a few mounted troops to do the scouting work when traversing woods. The woods have little undergrowth and numerous cross roads and paths.

Especially in rear-guard work the absence of mounted troops is likely to lead to infantry being intercepted by German machine guns and small bodies of mounted Uhlans, who hang on to a retiring force with great determination. These Uhlans are bold to excess and do a great deal of dismounted work.

Operations in woods call for the most deliberate preparation—a fact which is not always fully appreciated.

*Outposts.*—The importance of standing to arms an hour before daybreak is by no means fully appreciated. Naturally the exhaustion of the men is the difficulty in this. In the forward lines quarter to half the force is on outpost, and even in the third line back one-eighth of the troops are on outpost duty.

*Billets.*—The difficulty of finding officers at night in billets where they are covered up in straw, or on roads must be recognised. An adjutant must know exactly where the captain of each company is lying, so that he can wake him up without disturbing others. In the same way a battalion commander must sleep at a spot where the brigade-major can instantly find him.

*Advance under Artillery Fire.*—Several times it has been necessary to advance under unsubdued hostile artillery fire. Small columns at 50 yards' interval and 300 yards' distance have been found to be the best method of avoiding casualties. The 19th Brigade lying in the open in this formation were shelled by two batteries for half an hour and had only 25 casualties.

*Extracts from a private Letter from an Officer  
Commanding a Howitzer Battery.*

\* \* \* \* \*

1. Concealed positions are to be employed on nearly every occasion, batteries have been obliged on occasions to come into the open, but the result has generally been a heavy casualty list.

2. The German fuzes are excellent, but the Germans waste much ammunition and have a tendency to burst too high. They go in for the moral effect of a continuous volume of fire, which certainly has the result they aim at for a short time, after which we have got to rather despise it.

3. I have had no opportunity of seeing much of the French artillery personally, but a battery was in action close to me one day. It was very quick and appeared to be very effective.

4. To say that artillery cannot stop an infantry advance by itself is sheer nonsense. The German infantry will not face our artillery fire, nor that of the French.

5. The Germans, I think, register a lot. They appear to me to do very little ranging, but generally bring effective fire to bear immediately our troops appear at certain points which apparently have been registered, they either "register" or else have an extraordinary range-taker.

6. The equipment is sticking it well, the No. 3 director and one-man range-finder much better than I anticipated. Even the despised telephone equipment has proved far from unsatisfactory. I have been in action now for 20 days—my observation station about 1,000 yards from the battery—and I have been in constant communication night and day with only two small breaks of 10 minutes each, due to the wire being cut by German shrapnel, a really remarkable performance. It all depends on the knowledge the operators have of the instruments, and I am lucky in the extreme.

7. The German infantry cannot touch ours and their shooting is deplorable. They seem to depend entirely on their machine guns, which are the very devil and magnificently handled.

8. The Germans are adepts at "ruses"—false observing stations, bogus trenches, &c.—we cannot hold a candle to them in this respect.

9. The Germans do much shooting by aeroplane observations with a certain amount of success. Their airmen are very bold.

10. The German artillery would appear to consist of—  
15-pr. field gun, 3.03-inch.

A light field howitzer, approximately 4.2-inch.

A heavy field howitzer, approximately 5.9-inch.

An 8-in. mortar (?) commonly known as "Black Maria,"

a siege gun destined for the siege of Paris, but turned on to us here; its effect is very local. It is wonderfully accurate, and the Germans can put shell after shell from it in very nearly the same position. It has a very long range, 12,000 yards and more.

11. We did not do enough shooting by the map at practice camps, *e.g.*, I frequently get a order "aeroplane has reported a 6-gun battery in action 400 yards south of the O in COURTECON, engage it," but we do not do much of this kind of shooting in camps. Map reading strikes me as being enormously important.

12. Given a good map, a battery, the flashes of which are visible, can be knocked out by a concealed battery; I am proud to say I have done this on two occasions.

13. "Battery fire 1 second" with lyddite has a most disconcerting effect on a hostile battery, and will nearly always silence it if the approximate range has been found. Some batteries go in for a lot of salvoes, as also do the Germans.

14. The concealment of guns and waggon lines from aircraft observations is all-important; units which have ignored this have suffered tremendously.

15. I had a very good series yesterday with aeroplane observation and wireless communication, and am reported to have got a hit with lyddite on a German battery at the 11th round—on this point I am sceptical.

16. In my opinion, in a retirement the 1st line waggons should remain with, or close to, the battery; otherwise there is a tendency for them to get lost.

17. Obtaining the line of fire by magnetic bearing has been wonderfully successful; I have used this means of obtaining the line more than any other.

Such are my experiences for what they are worth. I am convinced that concealment of guns is everything, and many of our casualties are due to the non-observance of this.

One more point has occurred to me, and that is the importance of lowering the angle of sight when searching behind a hill. Otherwise shell when they come over the crest line are miles in the air and comparatively innocuous.

*Notes on Artillery in the present War, furnished by an Artillery Officer attached to General Head-Quarters.*

*Positions Occupied.*—With a few exceptions positions are completely covered, not only from view at the target end, but from hostile air observation. The enemy possess large scale maps believed to be as large as 6-inch, and, as soon as guns are located by them, a severe fire is brought to bear immediately. It is on this account important to avoid always conspicuous or easily-identified points on the map. Ranging, as we understand it, is as often as not dispensed with altogether. Open and semi-covered positions possess no advantage over covered positions. They would only be occupied on emergency and with the knowledge that the battery would probably be destroyed sooner or later.

Positions of readiness are only to be considered if well concealed, but guns not required in action are better placed safe out of range.

*Observing Stations.*—In the open position the choice appears to make little difference. If, however, occupied in the dark and the battery completely dug in, the battery commander is better on a flank clear of blast and smoke of enemy's high explosive shell. In covered positions the battery commander almost invariably observes from in front no matter what nature of gun. The distance, from 500 yards up to 1,000 and more, according to nature of operation and ground. Communication always by telephone. This, indeed, is the only possible means and endeavour is made to dig in the wire, perhaps with a plough.

In the event of wire being broken, recourse must be had to chain of orderlies. Megaphones are useful.

*Obtaining the Line.*—Two aiming posts seem to have been sometimes but seldom, used. A battery angle is sent if battery commander can see the battery; but far more often line is given roughly in a quick series or by compass or map in a deliberate series. Trial shots are

fired and correction made as required. With heavy guns the method employed is either the compass or direction given by a reference to a map placed on a plane table, the latter the most popular. Where possible, as in the operations on the Aisne, the 18-pr. gun may be used to range for the 60-pr. to save ammunition. There are many casualties to directors. The hand angle of sight is a good deal used. Plotter never used and may be dispensed with.

*Battery Head-Quarters* is too large. Signallers and look-out men are not wanted as a rule. Patrols and ground-scouts never—i.e., as part of the battery head-quarters. The battery commander has battery sergeant-major and a telephonist with him, and perhaps a director man who will take a few notes as penciller. The range-finder would be separately dug in, if used at all, and two or three men possibly dug in at intervals to pass orders on emergency. The ranging officer with the battery is dug in, probably under a limber in rear of line of guns, with telephone man. Section commanders are dug in close behind waggon bodies. The consensus of opinion of battery commanders seems to be decidedly against observation vehicles. They could only be used on certain occasions and are difficult to drag into position without being seen. Moreover, a battery commander does not feel secure perched up on such a vehicle. He prefers a tree or stack or building of some kind, or else to be dug right in. Climbing irons or dogs, rope ladders, &c., would be of great use. German observatories are never seen now; they are effectually concealed if used.

*Ranging.*—The keynote is simplicity. Section ranging with percussion—according to information at present available—is the method always used. It is not known if collective has ever been used or not.

*Objectives.*—More information is necessary before a full report can be made under this heading. Most batteries have never seen any such target as troops in the open or guns in any sort of position. There are exceptions, however, and guns have had to deal with infantry columns crossing the front, infantry advancing in large bodies—crowds—and the rush of an infantry counter attack. In such cases the 18-pr. shrapnel is admitted on all sides as being most efficient. Time is certainly not the important factor that it is at practice. At the open



pitched battles as at Mons and Cambrai, situations appear to have been considerably confused, and battery commanders were practically independent except those close to their own brigade head-quarters. Telephone communication broke down at once owing to the wires being cut, and any orders that reached battery commanders came by mounted messenger. There appears to have been no visual signalling.

*Gun Targets.*—At the battles just referred to there were cases of guns being located and even knocked out by shrapnel, but these seem to have been rare cases. The covered position is the one adopted and retained to the last. It must be clearly understood that the artillery duel is very much *en evidence*. All arms and all ranks agree that the artillery dominates the situation on either side. Its effect is devastating where a target is visible, and infantry, where the strengths approximate to an equality, are quite unable to face it. All efforts are consequently made to establish a superiority in artillery. On the battle-field there is no sign of battle bar the few bursting shell and a few strips of newly-turned earth, which mark the infantry trenches. Not a man or a gun is visible unless some effort be made to test the strength of some corner of the field; even then it will be invisible to nine-tenths of the front. The chief effort on either side is to locate the big guns by any means. We employ aeroplanes, but the enemy apparently employ an amazingly efficient secret service in addition. The aircraft are always at a height of about 6,000 feet if up at all, and there they appear to be immune from fire. The big gun positions are frequently changed—not less than every two or three days—but ours, however well concealed, are located to a yard by the hostile gunners, and 6-inch or 8-inch high explosive shell dropped right on the guns or in the pits. It is important that these big guns have alternative emplacements always ready for occupation at short notice, after dark, and these should always be irregularly placed with big intervals up to 100 yards, and at varying ranges of 50 yards or so. Inside a wood is often a suitable position. A megaphone in a wood carries well and assists section commanders in these difficult circumstances. Searchlights are hardly used at all. German balloons are always aloft, but our authorities are not in favour of these aids to observation, for reasons which have been thoroughly discussed.

The shooting of the German artillery can only be described as "uncanny." Occasionally great waste of ammunition takes place from, no doubt, faulty information, but parties of troops, whether gun teams, ammunition columns, bivouacs, billets and even head-quarters of brigades and divisions have to make constant changes of their position or incur the penalty of having a dozen of the large shells dropped right into them without warning and when least expected. Dummy batteries, observation posts, &c., to deceive hostile aeroplanes, have proved valuable.

Seventy per cent. of our casualties are said to be due to artillery fire, and most of them to the high-explosive shell. The "error of the gun" appears to be nearly non-existent, and it is quite common to see four high-explosive heavy shells dropped within 2 or 3 yards of each other. It is difficult to find any explanation for this, possibly the design of shell has much to do with it. The enemy's time fuzes are also astonishingly accurate, particularly those of the field howitzers. Their shrapnel is far inferior to that of the 18-pr. This is admitted by all. There appear to be very few cases of shields having been hit by bullets. Casualties generally result from the backward effect of the high-explosive shell. These will quickly destroy a battery when located, but shrapnel from frontal fire never will.

*Laying.*—There is no direct laying. Our methods have well answered the test of war.

*Methods of Fire.*—Gun fire is evidently very rare; battery fire is the usual method. The largest number of rounds fired by a battery in a day, according to present information, amounts to 1,152 for an 18-pr. battery, but the total number in the war is not double this for the same battery.

*Control of Fire.*—Voice control has been employed in some of the somewhat confused actions referred to above. A howitzer battery on one occasion was engaged with infantry at 600 yards, firing shrapnel full charge; voice control was employed. Another battery, the day after disembarkation from the train, had to cover a front of over 180 degrees. It was shot at later from in rear also. Voice control was naturally used, but in the normal action it would never be considered for a minute.

*Ammunition Supply.*—No very definite system has been evolved as being the best. As much cover as pos-

sible must be gained, both from overhead and from behind, if possible. Sometimes both wagons may conveniently be up, or wagon one side and limber the other side of the gun. Replenishment of ammunition is normally by carriers, but may be effected by wagons at night, &c. Limber supply does not appear to have been ordered, but the limber ammunition has often been used up.

*Corrector.*—Officers do not sufficiently use the table on page 164, *Field Artillery Training*. The cardinal fault of our shooting would appear to be bursting shrapnel too short; the same applies to that of the enemy.

*4.5-inch Q.F. Howitzers.*—Never used in brigade at all, often by sections. Time shrapnel ranging with the howitzer is believed not to have been used at all.

*60-pr. B.L.* has been invaluable. Economy of ammunition is of first importance. It can sometimes be attained by making use of the 18-pr. for ranging purposes.

*Entrenching.*—Types in *Field Artillery Training* of pits, &c., are not sufficient. Pits for men must be at least 4 feet deep and narrow, but many battery commanders prefer the gun to be in a deep pit. It depends partly on the weather. It is desirable to have a parapet in rear as well as in front, on account of the high explosive shell. Solid overhead cover is also desirable as far as possible. The width, 13 feet, is not excessive in bad ground or wet weather.

*Map Reading.*—Map reading forms a very important detail in the daily work of officers and non-commissioned officers, and any work out in the open after dark, and should, therefore, be practised as much as possible.

*Signalling.*—The amount of work and time devoted to visual signalling have not borne fruit in this war, but the more practice men have with the telephones and the buzzer the better. An enormous amount is dependent on the telephones. Heavy batteries go in for flag signalling with the Observation Officers.

On the whole, peace training is proved to have been on the right lines; but, from what has been seen, much more might be done with the advanced artillery officer. The Germans are said to use him to a great extent. Much has also to be learnt by artillery in their work in conjunction with aircraft. Some notes on this subject will form a heading in a later communication.

*Some Notes on Conversations with Wounded Royal Field Artillery Officers at Millbank Hospital.*

The German artillery at Mons was very well handled; as soon as they had located a battery, it would be taken on in front, and shortly afterwards would be brought under more or less enfilade fire from batteries to a flank.

The Germans fire high-explosive shell, as well as shrapnel, from their field guns. Their shell is very indifferent, and did very little damage, but their fire was very accurate. The shrapnel shells used by the British are superior to those used by the Germans. The high-explosive shells were sometimes used with a time fuze; the noise was terrific, but effect very local, probably not more than 20 yards each side. Germans fired entirely in bursts of fire; slow rate of fire never used. Bursts of fire consisted of from about six to twelve shells; as a rule, shells could be heard coming, and it was possible to take cover before they arrived.

When the German infantry got within about 1,500 yards, and the English artillery were beginning to get effective fire, our guns were bombarded with terrific rate of fire. Voice control was then no good, and no signaller could stand up. *The telephone was the only thing that was of any use.*

The German fire was greatly assisted by aeroplanes; they had a very good system of signals, and they gave the line and got the range in a very short time. After the first few days the English aeroplanes began to arrive on the scene, and the German aeroplanes then did much less.

When reconnoitring it is inadvisable to take too many officers away from brigades. An instance occurred of only two officers being left with the three batteries, while the rest of the officers of the brigade had gone off to reconnoitre positions for the guns. During their absence a serious crisis arose, which might have led to a serious disaster.

Always have patrols well ahead and well in touch with the brigade. An instance occurred of a brigade advancing into a village, and meeting an ammunition column in a narrow street, which was endeavouring to get back. That is, the two forces met in a narrow street, going in opposite directions. The confusion which ensued would have been avoided had there been a patrol in front of the brigade.

Owing to the distance batteries came into action behind the crest, it was found advisable for the battery commander to plant his own aiming posts.

The Germans, as a rule, search about 400 yards back from the crest—it is therefore advisable to be at least this distance back. It has also usually the advantage of getting less dead ground. The semi-covered position has turned out to be a bad one.

The battery commander should never use an observation limber, or have a limber for cover; a limber was once put up on the opposite flank to where observation party was, and drew fire from all round, so much so that the limber was never got away. A limber for the ranging officer at the battery is essential.

Section commanders must be as close as they can get behind the shield of the gun nearest the battery commander.

Gun pits or epaulments in the open are quite useless, they merely serve to draw fire—behind cover they are very valuable. Wagons must be placed very close to the guns—placed touching the guns. No space must be left, as bullets get through. A good many casualties were thus caused to ammunition numbers. Earth should be piled up about 18 inches high, and a couple of feet in front of the shield, to prevent bullets ricocheting through underneath.

Horses were practically never unharnessed. The firing battery wagons should be unhooked, and not, as a rule, unlimbered. The limber gives extra protection, and it is advisable to have as much ammunition as possible at the guns in case of emergency.

Loading numbers *must* keep the shell well covered up until it is in the bore of the gun. An instance occurred of a fuze, before being loaded, being struck by a shrapnel bullet, the result being that the loading number had both arms blown off, and the rest of the detachment were knocked out.

If possible, wagon line should be concealed altogether from view under woods, avenues of trees, &c. If this cannot be done, it is advisable to keep the wagon line on the move as long as the ranging aeroplanes are in sight, otherwise heavy fire will be turned on them, and great losses of horses will result.

A method of arranging the ammunition supply which was found useful was to have two first-line wagons close to the flank of the battery, and to use them to keep the firing battery wagons full. This can be done by utilizing the pauses between the bursts of fire—men running up with ammunition in carriers. As soon as these two wagons are empty, they should be removed, the teams hooked in, and be sent back to the ammunition column to refill. It was found best to refill these wagons, and not exchange them with those of the column.

Arrangements should be made in the event of its being desired to open fire again after dark. A lamp should be put well out to a flank, to be used after dark as an aiming point, and, in addition, a lantern (in the nature of a bull's-eye lantern) should be placed well to the front of each gun, to give it its line of fire, or, if necessary, it can be placed in rear of the gun, if it is well hidden from the enemy. It was by this means that the Germans constantly shelled the bivouacs after dark.



*Details.*

Inside edge of parapet to be riveted with posts and boughs from any suitable trees. The gun and trail platform to be kept as clear as possible.

The trench for spade is backed with any timber available, in order that the thrust of the spade may have a good bearing, and not tear up the ground and allow the carriage to run back.

The bottom of the trenches should be covered with straw or boughs, &c., in order to be comfortable for the men at night, and waterproof sheets stretched across the top to protect the men in rainy weather; drainage will be necessary.

The wagon is unlimbered and placed as shown in diagram, in order to afford protection from splinters, from back blast of H.E. shell, especially when burst on percussion. Ammunition can be served from trenches or wagons, and an extra wagon body can be left up, if necessary, to help close the space in rear, and the ammunition from its limber stored in the trench while the limber returns for more from the column.

The whole work must be cunningly concealed by trees and branches, in order to defy location by airmen, young trees being stuck in the ground in as natural a manner as possible.

Sacks of earth on top of wagons, parapet, &c., increase the protection considerably.

For the above pattern of protection, the cutting tools of a sub-section are sufficient, provided that they are in proper order, viz., hand saws properly set, and axes and billhooks sharp. A light crowbar is useful, if procurable.

*German Tactics.*

The following information was obtained from an officer who has been at the front:—

1. The German method of advance is to show a front with cavalry, in close contact with which is a highly mobile force of Jaegers conveyed in motor lorries, and accompanied by machine guns. When attacked, the cavalry calls up the Jaegers, who deploy behind the cavalry screen. The cavalry then withdraws, and the allied cavalry finds itself confronted by an infantry force with quick-firers.

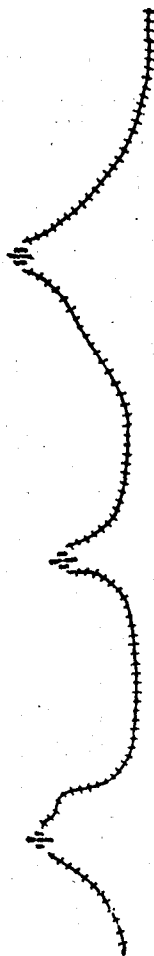


2. *German Rearguards*.—These consist of perhaps two cavalry regiments, several batteries of artillery, motor mounted machine guns, and 1,000 infantry on motor lorries. Each lorry carries about 80 men.

The infantry are rapidly transported from one place to another by means of these lorries. This occurred in rearguard actions, and during the fighting on the River Aisne.

3. *German batteries* are distributed when in action, the guns being posted in sections according to the lie of the ground. The various sections are connected by telephone. The range-finder is some distance to the front. Each battery has a powerful telescope, and the officers have 6-inch maps.

4. *Machine guns* in position are combined with wire entanglements, as shown in Plate VI. (page 29).

**Plate VI.**

The apparent gap in the entanglement is purposely made to draw the attacker into the field of fire of the machine gun.

In the encounters which took place in Belgium the Germans on several occasions brought up their machine guns immediately behind their most advanced line of infantry. They hid them (*e.g.*, on the first floor of houses) and allowed the enemy to advance past them and then opened fire on them from the rear. Also in defence machine guns are placed in first floor of houses. The French were ordered to shell all villages before attacking.

4. *Aeroplanes* direct the German artillery fire, particularly the fire of howitzers—our guns must be concealed by branches of trees, &c.

5. *Entrenchments*.—The Germans since the beginning of the war have made the greatest use of field entrenchments. The extent and the strength of the positions which they have prepared entail an attack upon them which approximates to regular siege operations.

The methods adopted in the German positions taken up on our front are in no sense hastily improvised but show a carefully thought out system.

The method adopted is as follows:—

- (a) To render the positions as inconspicuous as possible to patrols and aircraft.
- (b) To alter the natural surface of the ground as little as possible, and where these trenches cannot be concealed to prepare dummy trenches along the whole front in order to give a uniform appearance.
- (c) To hide the trenches and gun emplacements by means of branches, coloured canvas and plants, taking care that such alterations are not conspicuous to an observer.

The difficulties of reconnaissance experienced by aircraft have shown how carefully their system has been carried out.

The design of trench nearly always adopted is a very deep trench with parados and traverses for protection against shell fire and trenches in rear for supports joined to trenches in front by deep zig-zag trenches.

Their trenches have been designed in anticipation of a prolonged occupation with observation posts, certain

portions sheltered from overhead fire, drainage arrangements, excavated niches for rations, kit, ammunition, maps, search-lights, star shells, &c.

Dummy trenches, or trenches manned by dummies, are also used in front of the true position. The trenches actually occupied are concealed, and between them and the dummy trenches are wire entanglements, swept by fire from the former.

The attached plates are examples of some of the German designs for trenches. Plates VII. to XI.

6. *Wire Entanglements*.—Different types employed:—

(a) Very low pickets, 4 inches to 2 ft. 3 in. high.

(b) Normal, pickets, 5 feet high.

These are placed about 50 yards from the trench, carefully disguised and hidden by a glacis in front.

NOTE.—All these works are carefully covered up and disguised with branches, straw, and grass and made to look exactly like the surrounding country.

7. *German Artillery*.—Some notes on German artillery are attached in Appendix B.

### STAFF WORK.

1. *Orders*.—Complaints are frequent about the delay in obtaining receipt for orders. The best course to be adopted, if in scattered billets, is to deliver orders by an officer in motor car.

Staff officers should invariably get the receipt obtained for an order brought to them by whoever delivers the order.

It is never safe to trust to any form of verbal order or verbal arrangements; the most reliable messengers have been found to fail to deliver them or misinterpreted what was intended.

*Starting Point*.—It has been found that troops require a great deal of marshalling to get every one into their places at the starting point. No amount of writing seems to do this with units large or small coming in from various directions.

Energetic staff work on the spot is the only way. The starting point should be reconnoitred on the ground before it is given out in orders to see there is room on the road which will allow vehicles being pulled out of the way on to the side in order to leave room for the troops to pass.

It is difficult for a brigade staff to send an officer very often to head-quarters for orders; often nothing but a tired horse or a borrowed signaller's bicycle is available.

Some brigade head-quarters have found it essential to have a guard, with sentry, to insure being wakened at the proper time during the night or early morning before movement.

2. *Billeting*.—When troops are billeted in depth and brigade and divisional head-quarters are situated in rear it is advisable, in order to allow the head-quarters to get to the head of the column to fix a definite time for the head-quarters to pass the starting point and arrange for the fighting troops to fit in behind.

When approaching billeting areas the transport (1st line also) generally halts in the middle of the village and blocks the roads. This must be prevented.

It is most important that billeting officers should select, without delay, brigade, battalion, and company places respectively, where the transport is to halt while the detail of billets are being worked out.

Brigade billeting officers must rapidly select battalion and company billeting areas before the troops arrive and allow the latter to proceed at once into their billets and clear the roads.

3. *Demolitions*.—There have been complaints from Royal Engineer field companies that sufficient warning is not given to prepare bridges for demolition. Preparations of this sort take time. There have been failures in this owing to divisional orders arriving too late.

4. *Supplies*.—The issue of supplies, especially fresh meat and groceries, does not seem to have worked very well. It was understood that supplies would arrive in mechanical transport at brigade refilling points, packed in bulk for the brigade, and that it would there be divided up amongst brigade head-quarters and the four battalions. It has been found that there is a scarcity both in men and implements at brigade refilling points to enable this to be done. This, therefore, needs very careful arrangement.

It has been found that Army Form B 55 (Ration Indent) was only being handed in on the same day, in

fact, at same time as supplies are drawn. This is running things too fine, and arrangements are needed to remedy this.

The supply, *personnel* and *matériel* has been very overtaxed in issuing daily supplies, with the result that wagons have been kept waiting many hours at re-filling points, and then often have returned empty. Careful organization is needed to prevent a breakdown.

5. *Ordnance, Pay, &c.*—There was at first a general lack of knowledge as to the machinery for obtaining cash for pay, the execution of ordnance services, remounts, repairs, requisitions on local resources, or how payment is to be recovered for work done by local tradesmen, &c. Lack of previous clear-cut arrangements all adds to the amount of written work which has to be done.

In the 1st Division the arrangement made for repairs to wagons, &c., was as follows:—

Each brigade major was given *5l.* imprest account. Repairs when done by local workmen were reported to the Assistant Director of Ordnance Services, who paid direct in cash. If the brigades, however, were out of touch with divisional head-quarters, such services by local tradesmen were paid in cash and a receipt sent to the Assistant Director of Ordnance Services, who reimbursed the brigade major or other individual who paid the bill.

Units are ordered to indent on Assistant Director of Ordnance Services for any requirements; if not immediately met, these indents enable the Assistant Director of Ordnance Services to look ahead and do the best he can to meet urgent demands.

6. *Discipline.*—March discipline easily becomes slack, straggling has to be rigidly guarded against. Men fall out on the march into cafés, &c. March discipline must be kept at all hazards, otherwise battalions and companies get very short of fighting men.

7. *Sick Horses.*—Considerable trouble has been caused by units leaving lame horses, &c., scattered about the country. The Assistant Director of Veterinary Services should co-ordinate the work and collect the horses in one spot as far as possible.

8. *Intelligence.*—Very interesting information relating to lines of march, order of battle, &c., may be found in

the pocket-books and personal diaries of German prisoners, or even on the bodies of their dead.

Our soldiers should be cautioned against carrying among their private papers any information which might, in the event of their falling into the enemy's hand, afford intelligence to the latter regarding the movements and composition of the allied armies.

9. *Uniforms*.—The following applies to men of all arms and to every branch of the German Army:—

The number of the army corps, regiment, battalion and company is marked, together with the man's personal number inside the lining of the tunic.

B.A. XV = Bekleidungsamt (clothing department) of the XVth Army Corps.

Identity discs show whether a man belongs to the Standing Army, the Reserve or the Landwehr.

R.I.R. = Infantry Regiment No. 98, Arms (rifles and bayonets) are marked in the same manner.

10. *Instructions for military police*.—An example of instructions, as issued by the 5th Division for military police, is attached in Appendix A as a guide.

11. *Dress*.—It has been found that men have been in the habit of wearing unauthorized articles with their uniform, and of giving away cap badges, shoulder straps, &c., and also articles of equipment not required at the moment. Orders against this require to be very strictly enforced.

12. *Courts Martial*.—Many irregularities have occurred through the difficulty of obtaining a copy of the Manual of Military Law. It is therefore recommended that all officers should record in their note books a few details as to procedure, particularly as regards field general courts martial, *e.g.*, that it is necessary to record in writing sufficient evidence to prove the charges.

13. *Returns*.—It is important that Army Form B 213 should be rendered punctually by units to Deputy-Adjutant-General, 3rd Echelon, Base, as it is by means of this return that next-of-kin are informed of casualties. This return can only be made up accurately by units after a roll-call. It is, therefore, necessary that a duplicate of a nominal roll should be kept by each company on the person, and another copy with the

baggage section of the train. The roll should be called at the earliest opportunity and casualties reported at once.

14. *First Field Dressings*.—It is found that men are in the habit of using their first field dressing to tie up minor cuts, &c. Also when dressing a wounded man they use their own field dressing instead of that on the wounded man, and thus become deficient of their own dressing. Special instructions appear to be necessary to stop this practice.

15. *Iron Rations*.—Care is necessary to see that men retain their iron rations intact. An impression exists that the iron ration consists of two squares of Oxo and a tin of groceries, and it should be made clear that the tin of preserved meat, &c., is also part of the ration.

16. *Officers' Kits*.—As the baggage section of the train may be out of touch with units for days at a time, officers are recommended to be independent of it as regards some warm clothing for the night, washing and shaving articles, &c.

17. *Water*.—A good deal of water is to be found in most villages, and it is as a rule fit to drink. The practice of filling water bottles direct from the pumps is wasteful and should not be allowed. Mess tins or buckets should be filled from the pump and the water bottle filled from them.

18. *Re-filling*.—It is often impossible to carry out re-filling of trains from tailboard to tailboard. It is generally found more convenient for supply columns to deposit their stores on the ground and for supply sections of the train to re-fill from the heaps thus made. By this method the supply column is able to return to railhead immediately.

19. *Local Supplies*.—A scale of local charges drawn up by the French authorities is available for inspection at the Mairie of each village. Draught oxen have been found very good to eat, as owing to the war they have not been worked for some time and are in soft condition. At least one pair should be left to work on each farm, and as the pairs are accustomed to work together, odd numbers should not be taken.



### *General Information.*

1. The 3rd Infantry Brigade says "Axol" lamp has proved invaluable.

2. It is recommended that all troops, both officers and men, should carry tea and some sort of "billy" to boil water in and drink out of. The food wagons often do not come up and all that can be got is the tea made in a "billy" and the biscuits that each carries in his haversack.

3. It is dangerous to touch the heads of the German unexploded 10.5 cm. (4.13-in.) shell.

NOTE.—This probably refers to the universal shell used in light field howitzer; see Appendix B (b).

### *Notes from the Diary of a private individual travelling in Belgium during the latter part of August and the month of September.*

The Germany army as a piece of machinery has been almost perfected. The only mistake that has been made is that of disregarding the human element, and the taking for granted that the one great essential for the success of the military operations—Time—will work out according to the pre-arranged schedule. One very interesting and novel feature is apparent. Infantry, regarded as infantry alone, solely dependent upon mobility, and accurate rifle fire, initiative, and what the French term *élan*, has been subordinated to mass movements. An infantry regiment is employed merely as a support for artillery and for the machine gun. In the 1st and 2nd line troops I should judge that 10 to 12 Maxim guns are attached to every infantry regiment. They are handled and transported as regimental transport. A regiment of German infantry could pass through a town, and an observer reporting on their passage would swear that he had seen no machine guns of any kind.

*Ambulances.*—The ambulance service also is most interesting. On entering the towns all motor cabs or other

suitable vehicles are taken; such vehicles, including the ordinary taxi cab, are very rapidly transformed into an ambulance capable of carrying at least eight wounded men. This is done by a force of carpenters and machinists who simply remove the body from the chassis and substitute a frame of wood covered with canvas. The wounded are generally brought into hospitals at night—for it is the policy of the Germans to conceal their losses in every way, both from their own men and from the inhabitants. (Sketch, Plate III., attached.)

*Machine Guns.*—The gun as it rests on the ground (Plate I., Figure A) is about the height of a man in the firing position lying down. When raised (Plate I., Figure B) it is about the height of a man kneeling. A spectator saw 50 of these guns loaded into small two-wheeled carts and into motor trucks, which are mentioned later; the operation of loading took less than 35 minutes. As they passed through a town no one would have detected from any evidence that any machine guns had been taken through the streets. The machine gun is sometimes carried in the manner of an African hammock on the shoulders of bearers. They move it also carrying it as they would a stretcher (Plate I., Figure C), with a blanket thrown over the gun and a couple of knapsacks or perhaps an ammunition box; when carried in this manner the gunners at a distance are easily mistaken for stretcher-bearers carrying a wounded man off the field.

Plate II., Figure A, contains hasty sketches of the two-wheeled cart which is fitted to transport three of these guns. They have two men to every gun. The driver and another man ride on the seat, and each cart is accompanied by a mounted non-commissioned officer or, perhaps, subaltern.

The members of this mobile machine-gun force march light, their knapsacks, blankets, and in some cases their rifles, being carried in the carts. The mounted men that accompany them have a rope and leather harness, so that the horse can be used as the leader of a tandem in case of heavy going. The cart has strong and steady springs. The appearance of the cart with its load of, in some cases, bundles of forage, knapsacks, haversacks and blankets, would attract not the slightest attention.

The guns at the bottom were absolutely hidden. The cart is somewhat like an English butcher's cart, only much heavier. The tailboard drops down in the ordinary way.

In regard to the motor vans, they carry nine guns, placed as shown in the sketch. (Plate II., Figure B.) The vans have evidently a shallow false bottom. This is very carefully concealed, so carefully indeed, that it is said that some of these lorries have been captured and lost without the guns having been discovered by the captors. A small tailboard, which drops down, facilitates the guns being hauled out or replaced. A heavy load is placed on top of the false bottom. The sides of these motor vans are quite high, and in many cases I saw machine-gun detachments of no less than 15 or 16 men carried on a van.

The use and mobility of machine guns carried in this manner is, of course, apparent. They are always up with the regiment, and can be taken over any ground without difficulty to support an advance or cover a retreat. Moreover, if necessary, they can be concealed from falling into the hands of an enemy by digging a shallow grave, wrapping the gun, &c., in a blanket, and covering the whole with a few shovelfuls of earth.\* The two spikes (Plate I., Figure D) are used to fasten down the footplates of the machine-gun mounting. They can be driven into the floor of buildings and into the interstices of cobblestones, besides being used in ordinary ground. Each pair is connected with a strap or a chain.

The ammunition boxes are carried under the seat of the wagon and are probably concealed somewhere in the motor van.

The ammunition is probably carried in what appears to be the trailer to an ordinary two-wheeled cart.

*Entrenchments.*—Plate IV. gives a plan of some German trenches and the way they have arranged their wire entanglements. These are drawn from some examined near Liège, where the Germans have had time to entrench very carefully.

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\* Machine guns have actually been found buried in this manner. It is understood that the wooden cross marking their sites had a slight distinguishing mark.

## APPENDIX A.

PRELIMINARY INSTRUCTIONS FOR THE MILITARY  
POLICE, 5TH DIVISION.

1. *General.*—The usual routine police duties will be continued at the peace station pending entrainment. The military police will make themselves acquainted with the names or numbers of the various units comprising the division, and with the names and ranks (and, as far as possible, the personal appearance) of officers of the head-quarters of the division, and of head-quarters of artillery and infantry brigades.

2. *Command.*—In the absence of the Assistant Provost-Marshal, military police attached to the head-quarters of artillery and infantry brigades will act under the direction of the staff captains of those brigades.

3. *Duties on March.*—On the march, the non-commissioned officer and military police attached to the head-quarters of the two rearmost infantry brigades will invariably march with, and in rear of, the baggage section of the divisional train, and will prevent straggling. Stragglers and animals will be collected and march back to their units at the first opportunity. Stray animals not identified will be handed over to the nearest mounted unit. No man except the driver is to be allowed to ride on a wagon, unless provided with a pass signed by the transport officer. When passing through towns and villages the military police will march in rear of the formations to which they are attached, collect and bring on all stragglers.

4. *Sale of Liquor.*—Non-commissioned officers and men of the division are forbidden to enter any hotel, inn, or restaurant abroad for the purpose of buying liquor of any kind. The proprietors of such places (which are placed out of bounds) will be warned not to sell liquor to the troops, and the names and addresses of any proprietors or purchasers infringing this rule will be noted and reported to the Assistant Provost-Marshal.

5. Close touch and mutual co-operation will be maintained between the military police attached to the headquarters of formations and the regimental police belonging to the units of those formations.

6. Great care will be taken to protect the persons and property of the inhabitants from any violence or plundering, and they are to be treated courteously.

7. The military police will always endeavour to get into touch with and co-operate with the civil police in maintaining order.

8. *Illegal Requisitioning.*—Only supply officers, Army Service Corps, and ordnance officers are authorized to make requisitions for supplies and material, &c., for current requirements.

Indiscriminate requisitioning by other individual officers, warrant officers, non-commissioned officers and men and the granting of requisition receipt notes, is strictly forbidden and will be treated as plundering under the Army Act.

9. *Sutlers.*—Traders and sutlers endeavouring to accompany and deal with the troops, unless provided with a pass signed by the Assistant Provost-Marshal, will be placed in custody and handed over to the civil police.

10. *Powers of Arrest.*—The military police may at any time arrest and detain for trial persons, subject to the military law, committing offences, and are authorized in cases of emergency to call on any troops to assist them by supplying them with guards, sentries, or patrols.

11. *Charge Reports.*—When handing over an offender to his unit for disposal, care will be taken to hand in a charge report at the same time. A duplicate charge report will be rendered to the non-commissioned officer i/c of the detachment of military police and by him to the Assistant Provost-Marshal. It is particularly necessary that the names and addresses of all civilians whom the military police may have to give in custody, or call as witnesses, should be carefully noted at the time, and also the names of the places where they may be found. The military police will likewise take steps

to procure at the time (or within 24 hours) a charge report duly signed for each person handed over to them for custody.

12. *Field Punishment.*—When an offender is handed over to the military police for execution of sentence of field punishment, or otherwise, a return is to be rendered by the officer by whom he is handed over showing the name and description of the offender, the offence, the date of award of punishment, the punishment awarded, and the name of the awarding officer. A committal warrant is not required for a sentence of field punishment. A register will be kept by the non-commissioned officer in charge of the military police with each formation of all punishments inflicted by them and how the offenders were disposed of after punishment. An extract dealing with the period from Sunday to Saturday will be sent to the Assistant Provost-Marshal each Sunday morning.

13. *Billeting Parties.*—Two military police from divisional head-quarters and one from the head-quarters of each infantry brigade will accompany the billeting parties daily, and will march in rear of the advanced guard. On arrival in their respective billeting areas they will see that the water supply is not fouled, and will ascertain the situations of hotels, liquor shops, houses of ill repute, and houses containing cases of infectious disease, and report them to the Assistant Provost-Marshal or staff captains with a view to their being placed out of bounds, and guards placed over them if necessary. They will make themselves acquainted with the position of head-quarters offices of the division or brigade and of hospitals, &c.

14. *Billets, Bivouacs.*—The military police will patrol billeting or bivouac areas from the time of arrival until half-an-hour after "lights out" in order to maintain order and prevent men leaving their billeting areas without permission, or other irregularities. When billets or bivouacs are vacated the military police will remain behind and see that no loose papers or other things are left behind which would give any clue to the designation or numbers of the formations that have occupied the billets over night.

## APPENDIX B.

## GERMAN ARTILLERY.

Horse and field artillery have the same 15-pr. field gun (1896). Field howitzer batteries are armed with a new light howitzer (1909).

(a) The *Field Gun* is the old 15-pr. converted and mounted on a shielded gun-recoil carriage.

Calibre, 3.03 inches.

Range with time fuze up to 5,500 yards.

Range with percussion fuze up to 9,186 yards.

Maximum rate of fire, 20 rounds a minute.

*Ammunition*.—Shrapnel or H.E.

H.E. is being replaced by a universal shell.

Weight of shrapnel or H.E. is 15 lbs.

Contains 300 bullets (45 to the lb.).

H.E. shell contains 7 ozs. of nitro powder with fulminate detonator.

Rounds per gun in battery, 132. In ammunition columns per gun, 246.

(b) The *Light Field Howitzer*, issued in 1910.

Calibre, 4.13 inches.

Rate of fire, at least 6 rounds a minute.

Time fuze range up to 5,800 yards.

Percussion, 8,100 yards.

*Ammunition*.—Shrapnel and H.E. which are to be replaced by universal shell as soon as the present stock is exhausted.

Weight of shrapnel or H.E., 31 lbs.

Weight of universal shell, 31 lbs. (nearly).

A universal shell for howitzers contains 500 bullets (42 to the lb.), 5½ ozs. of picric acid with fulminate detonator.

When burst on percussion the high-explosive bursters in the head and among the bullets detonate, giving the effect of a powerful mine shell.

Rounds per gun in battery, 91.

Rounds per gun in ammunition column, 147.

(c) *Heavy Field Howitzer Battery* (4 howitzers in a battery).—15 cm. (5.9 inch) heavy field howitzer is mounted on an old type of heavy limbered carriage. Pattern 1902. Weight behind the team about  $2\frac{1}{2}$  tons.

Maximum range, 8,150 yards. Effective range, 6,000 yards.

Rate of fire, 2 or 3 rounds per minute.

*Ammunition*.—H.E. shell weights 89 lbs.

Percussion fuzes, with or without delaying action, are employed. Bursting charge is 11 lbs.

Rounds per howitzer in the battery, 72.

Rounds per howitzer in ammunition column, 360.

(d) *21 cm. (8.27-inch) Mortar Battery*.—This mortar is really a breech-loading howitzer.

Maximum range, 8,400 yards.

*Ammunition*.—Weight of H.E. shell, 262 lbs.

Rounds per gun in battery, nil.

Rounds per gun in ammunition column, 173.

(e) *Siege Artillery*.—

(i) *28 cm. (11-inch Howitzer)*. Range 12,000 yards.

It was reported in March, 1913, that there were six batteries each of two of these howitzers, but according to a Belgian officer who was at Namur in August, 1914, there were 30 batteries of these guns.

Reports have also been received in 1913, of a 32 cm. ( $12\frac{1}{2}$ -inch) howitzer being introduced.

(ii) *42 cm. (16½-inch Howitzer)*.

It is reported that there are 10 of these in the German Army and that they are manned by Krupp's men. Their length is about 12 feet and the height of the shell is 5 ft. 1 in. Waggon with cement to make platforms accompany the men.

Two of these are reported now about Lille.

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**PLAN OF GERMAN TRENCHES DESIGNED FOR  
A BATTALION WITH EMPLACEMENTS FOR  
MACHINE-GUN FLANKING FIRE.**

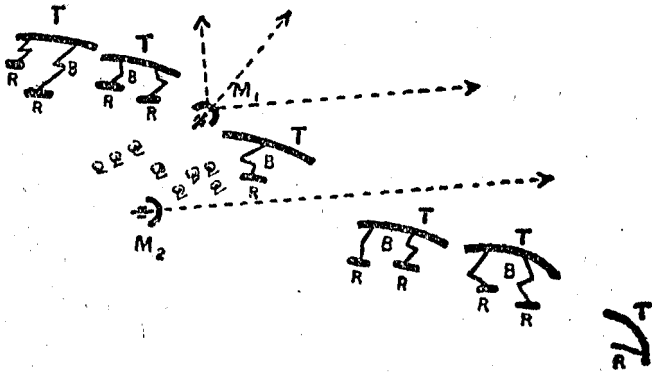
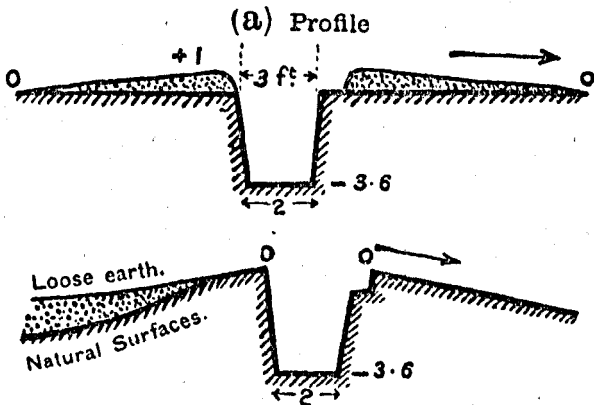


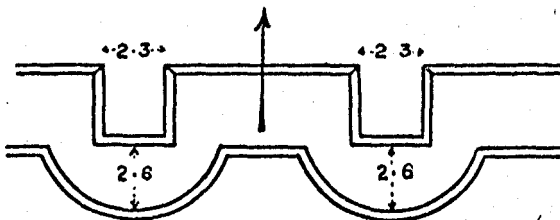
Plate VIII.

DESIGN OF DEEP RIFLE TRENCHES.



NOTE.—The loose earth which is thrown behind the Trench is covered with grass or straw.

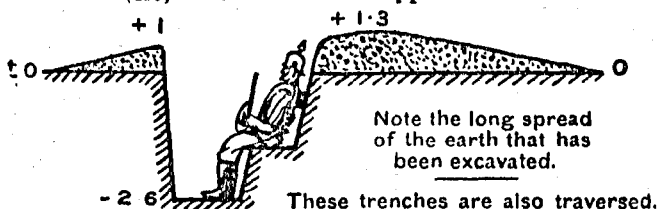
(b) Traversed Trenches.



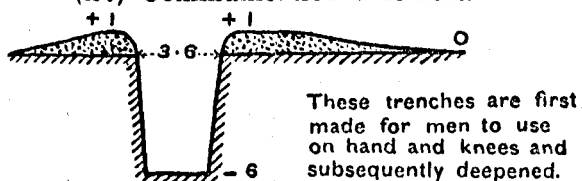
The slopes of the traverses are revetted with planks.

## SUPPORT AND COMMUNICATION TRENCHES.

## (a.) Trenches for Supports.

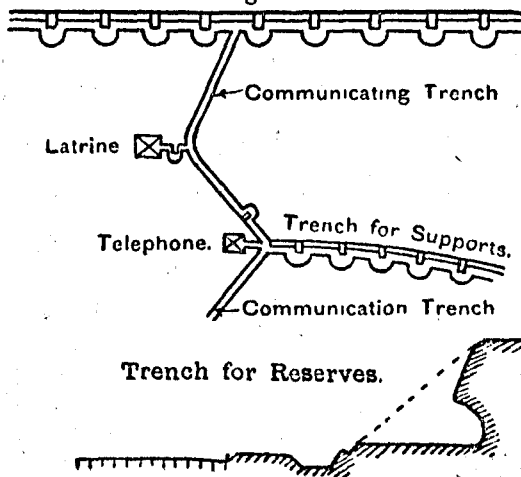


## (b.) Communication Trenches.



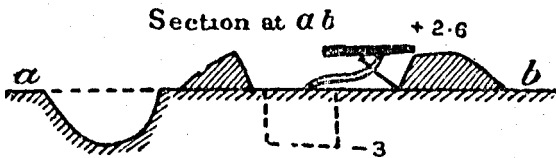
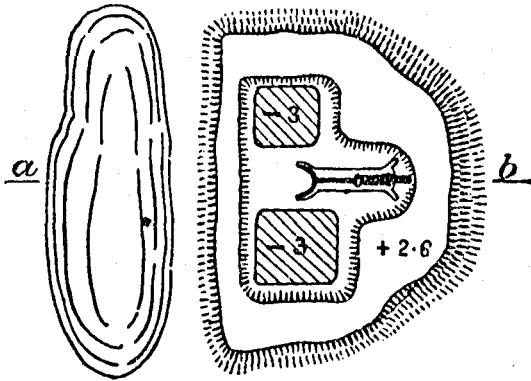
## (c.) Combined Trenches.

## Firing Trench.

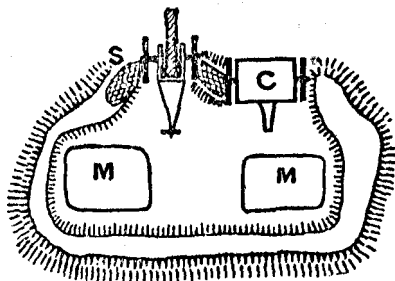


## Plate X.

## MACHINE-GUN EMPLACEMENT.



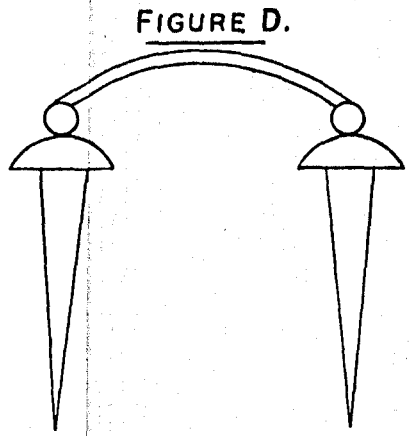
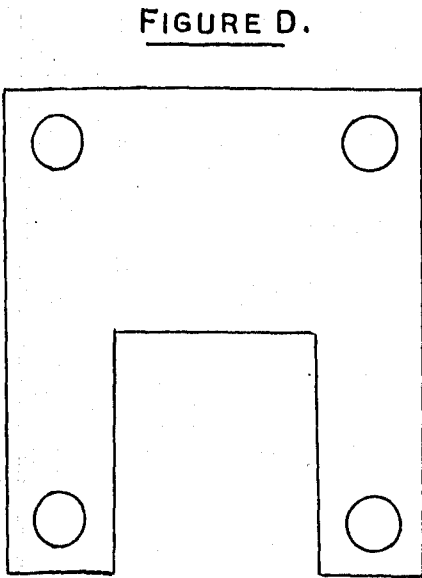
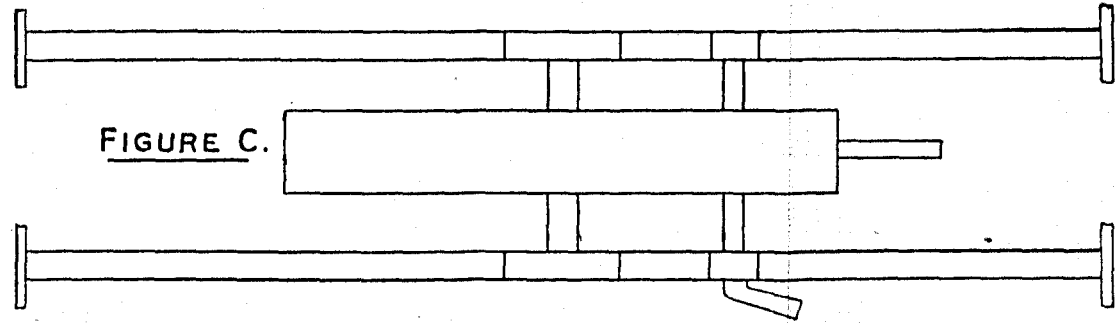
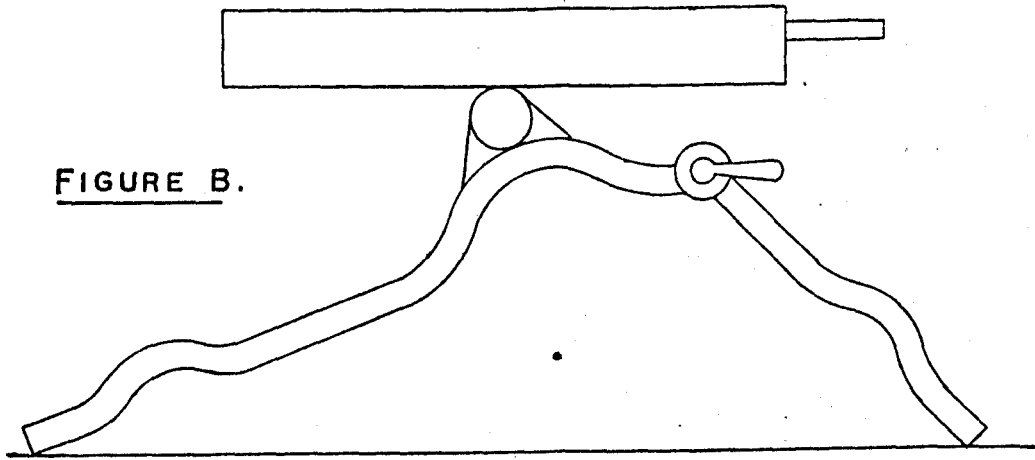
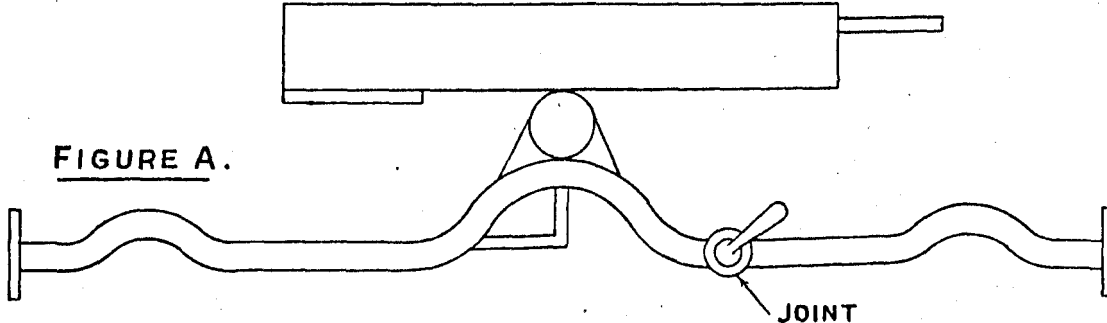
**EPAULMENT FOR FIELD ARTILLERY AS THROWN  
UP DURING AN ENGAGEMENT.**



- M. Trench for gunners.
- S. Sandbags.
- C Limber.

This design is improved by lateral covered shelters.

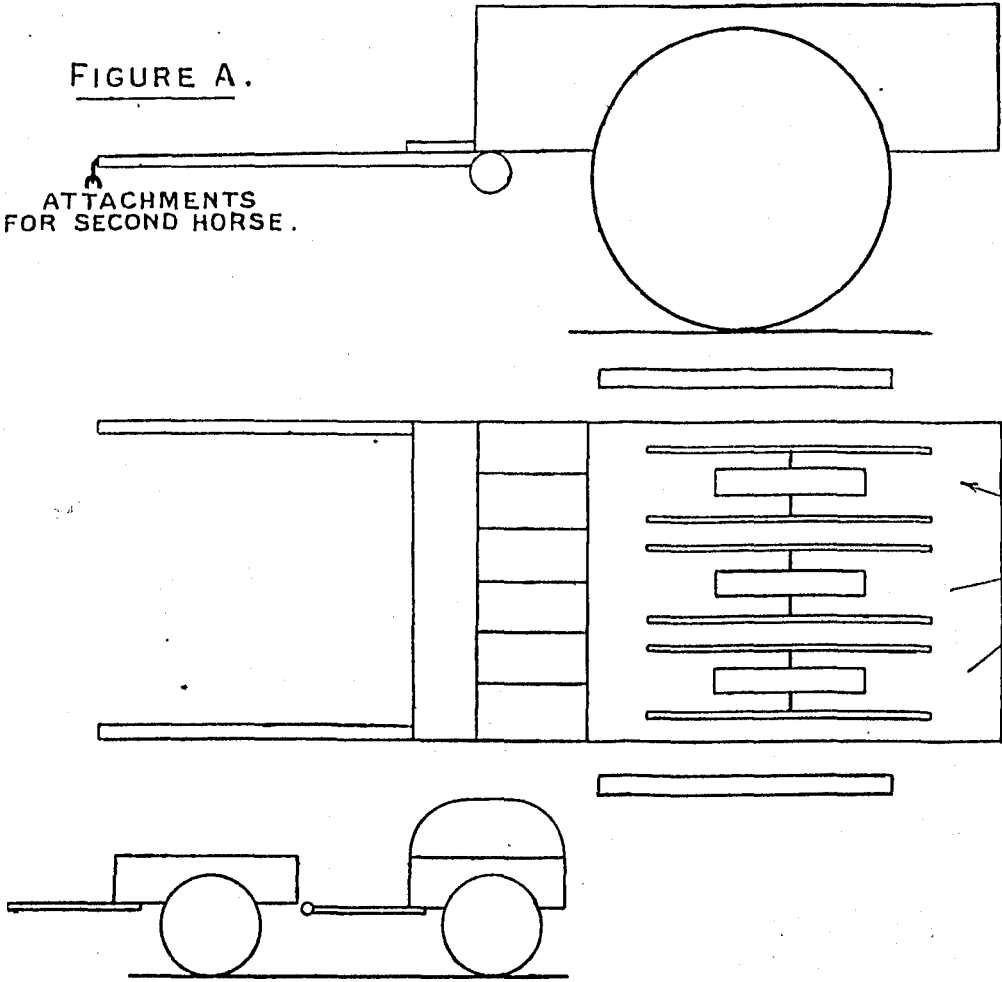
SKETCH OF MACHINE GUN AND MOUNT.



SPIKES  
ATTACHED TO STRAP  
OR CHAIN.

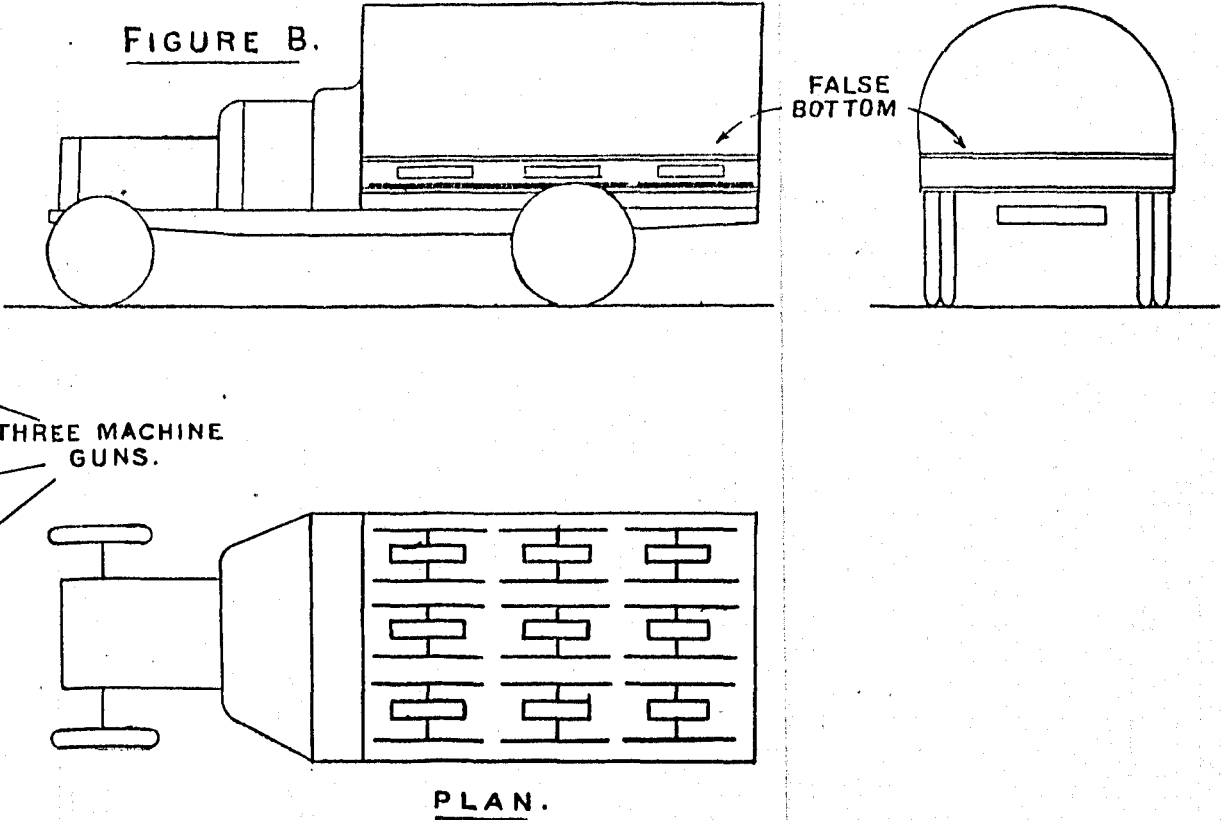
GALLOPING CART CONTAINING THREE GUNS.

FIGURE A.

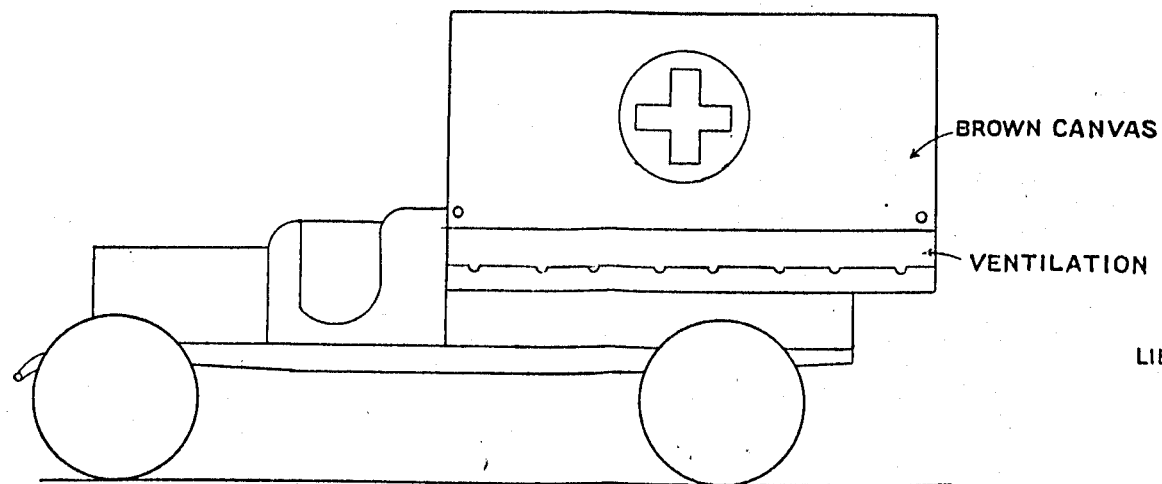


MACHINE GUNS IN MOTOR TRUCK.

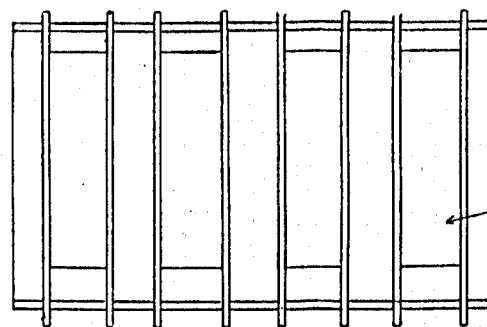
FIGURE B.



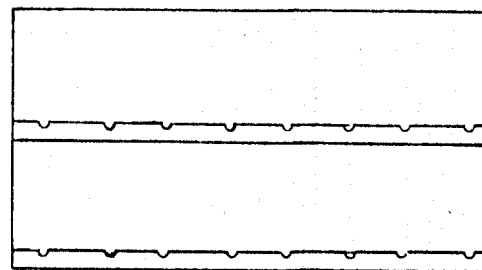
TAXI CAB AMBULANCE TO CARRY 8 WOUNDED.



WOUNDED TO  
LIE ATHWARTSHIPS

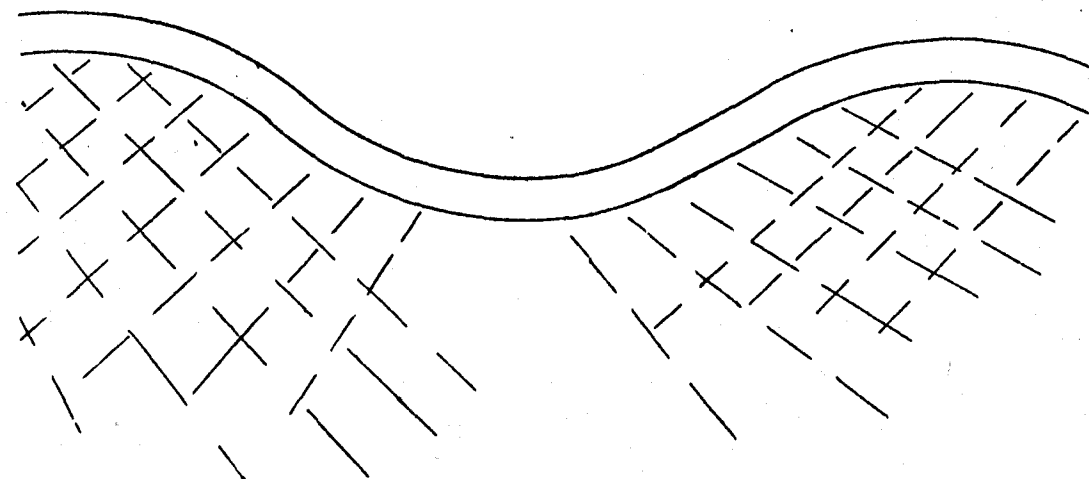


PLAN.

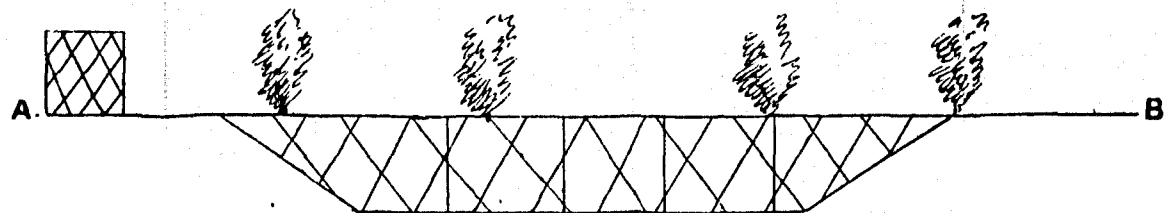
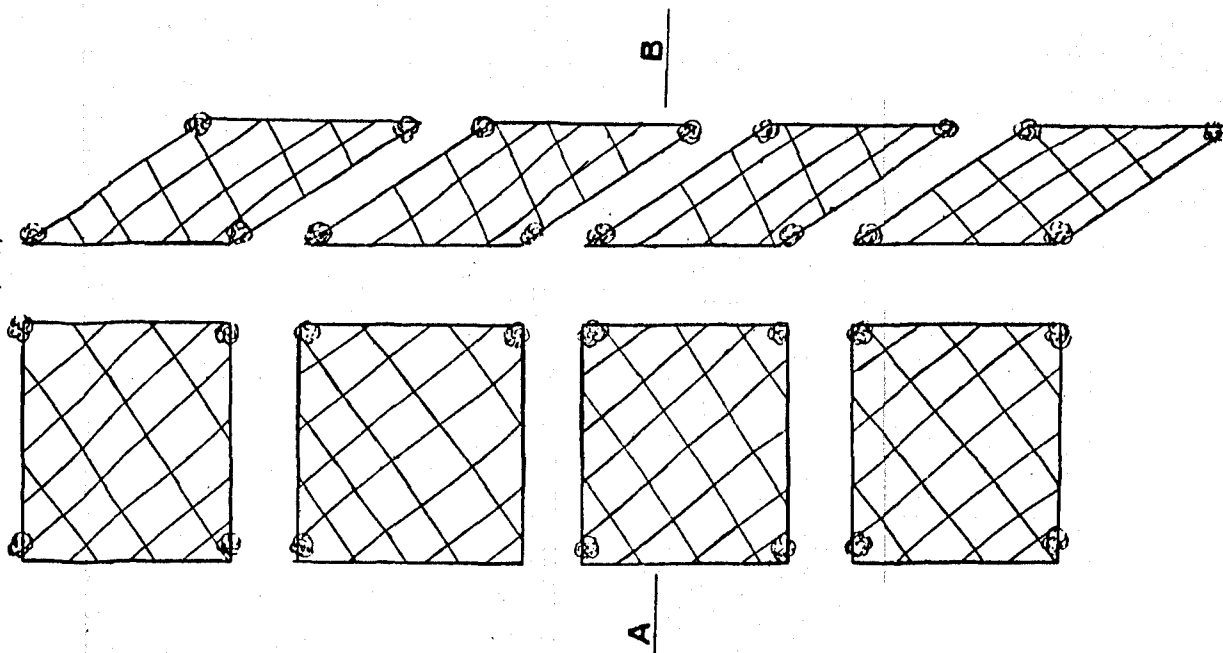


SECTION OF  
BODY SHEWING  
DOUBLE DECK.





TRENCHES SITED FOR ENFILADE FIRE.



SECTION OF ENTANGLEMENTS THROUGH LINE A.B.

(SCALE SLIGHTLY DIFFERENT.)